Final Environmental Assessment for Computational Research and Theory Facility Project

DOE/EA - 1700

Lawrence Berkeley National Laboratory

February 2011

FINDING OF NO SIGNIFICANT IMPACT FOR THE PROPOSED COMPUTATIONAL RESEARCH AND THEORY FACILITY PROJECT AT LAWRENCE BERKELEY NATIONAL LABORATORY, BERKELEY, CALIFORNIA

AGENCY: U.S. Department of Energy (DOE)

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: The DOE has completed an Environmental Assessment (EA) [DOE/EA-1700] that evaluates the potential impacts of the proposed Computational Research and Theory Facility Project (CRT) at Lawrence Berkeley National Laboratory (LBNL). The action proposed by the DOE is to relocate and consolidate Advanced Scientific Computing Research (ASCR) funded LBNL programs with other LBNL/University of California (UC) Berkeley programs that focus on computational and computer science research in a new facility on the LBNL site. To satisfy the above stated programmatic and space needs, the UC would construct a new building on the LBNL site. The construction of the new building by the UC would be a consequence of the DOE's Proposed Action. The EA has evaluated the impacts of the relocation and consolidation of ASCR funded research, and the construction, operation and eventual decommissioning of the CRT facility.

A draft version of the EA was issued for public comment on September 14, 2010, revised as appropriate based on public comments, and issued as final in February 2011. Based on the analyses reported in the EA, the DOE has determined that the Proposed Action is not a major Federal action that would significantly affect the quality of the human environment within the meaning of the National Environmental Policy Act (NEPA) of 1969 (42 USC § 4321 et seq.), the Council on Environmental Quality Regulations (CEQ) (40 CFR §§ 1500-1508), or the DOE's NEPA implementing regulations (10 CFR Part 1021). Therefore, the preparation of an Environmental Impact Statement (EIS) is not necessary, and the DOE is issuing this Finding of No Significant Impact (FONSI).

DESCRIPTION OF THE PROPOSED ACTION: The action proposed by the DOE is to relocate and consolidate ASCR-funded LBNL programs with other LBNL/UC Berkeley programs focusing on computational and computer science research in a new facility on the LBNL site. One possible location to accomplish the DOE's need would be the UC's CRT building, which is proposed to be constructed at LBNL. In order to evaluate and disclose the consequences of the Proposed Action, this EA evaluates the impacts from the relocation and consolidation of equipment and personnel and also evaluates the impacts from the construction, operation, and eventual removal of the building and equipment once these reach the end of their useful lives.

PURPOSE AND NEED: The overall purpose of the Proposed Action is to support the DOE Office of Science mission in Computational Research and Theory by operating the National Energy Research Scientific Computing Center (NERSC) as the premier computing user facility for the research community, and to conduct programmatic and applied research and development in the fields of computational science, computer science, and applied mathematics. The Project need for a new high performance computing space is due to the immediate and projected deficiency in high performance computing space at the Oakland Scientific Facility (OSF), which currently houses NERSC, and to remove the constraints to intellectual exchange and collaboration resulting from the dispersed locations of ASCR-funded LBNL and other related programs and researchers.

ALTERNATIVES CONSIDERED: In addition to the Proposed Action, impacts were also evaluated for other alternatives, including a No Action Alternative; construction of a new building at the Cafeteria (Building 54) Parking Lot Site on LBNL; construction of a new building at the Richmond Field Station (RFS); construction of a new building at the site of the former California Department of Health Services building in Berkeley; and leasing a facility on San Pablo Avenue in Berkeley, California. Alternatives considered but eliminated included expansion of the OSF, alternate construction sites on LBNL, and a reduced size construction alternative. Expansion of OSF was eliminated because OSF would not have the capability to provide adequate power for future needs. One alternate site at LBNL, the Building 25 and 25A site, was eliminated because another project is planned for the site. A second alternate site the Building 51 site, was eliminated because it would not be available in time and there may be subsurface contamination that would have to be removed before the site could be reused. The reduced size alternative was eliminated because it would not meet the purpose and need of the project in that it would reduce the office space by one-half, thereby defeating the objective of consolidating the ASCR funded and related programs and researchers.

The No Action Alternative was also evaluated to provide a baseline for comparison of the impacts of the Proposed Action against the impacts that would occur, if the DOE does not relocate the ASCR-funded and other related programs and researchers. Under the No Action Alternative, NERSC would remain at the OSF, and a new building would not be constructed. However, the No Action Alternative fails to meet the project purpose and need because the OSF would have neither adequate space to accommodate two future supercomputing systems at one time nor have adequate mechanical space and electrical service capacity to handle the computing facility growth projected for NERSC.

ENVIRONMENTAL IMPACTS: The EA assessed direct, indirect, and cumulative impacts of the Proposed Action and alternatives on the following resources, each of which is discussed more fully below:

- Air Quality,
- Biological Resources,
- Construction Traffic Accidents,
- Cultural Resources,
- Greenhouse Gases,
- Geology and Soils,

- Hazards, Human Health, and Accidents,
- Noise,
- Population and Housing, Socioeconomics, and Environmental Justice,
- Public Services,
- Transportation and Traffic,
- Utilities and Waste Management,
- Water Resources, and
- Visual Resources.

The Proposed Action would result in minor impacts to some of the environmental resources and no impact to two of the environmental resources. Certain standard project features (SPFs) that are a part of the Proposed Action are also discussed in the EA.

Air Quality

Potential air quality impacts would be minor under the Proposed Action. Construction activities associated with the CRT facility would generate fugitive dust emissions from site grading, building construction, hauling of equipment, hauling soil to and from the site, and construction worker commuting. These emissions would be temporary and would be further reduced by LBNL SPF AQ-1a, which is included in the Proposed Action and would require basic, enhanced, and optional control measures to minimize the generation of fugitive dust. This measure would reduce the fugitive dust emissions to acceptable levels. In addition, construction activities for the CRT facility would generate criteria pollutants (ROG, NO_X, PM_{10}, $PM_{2.5}$, CO, and SO_2). Emissions would not exceed de minimis levels for any of the criteria pollutants. Traffic generated by the Proposed Action would not result in substantial CO concentrations or cause a CO hotspot. Once constructed, the Proposed Action would result in operational emissions from the staff vehicle trips to and from the site, boiler operations, emergency generator testing, and general area sources. Operational emissions associated with the day-to-day activities of the proposed CRT facility would not exceed de minimis levels for ROG, CO, NO_X, SO_X, or PM_{10}. $PM_{2.5}$ emissions would not exceed Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act (CEQA) thresholds of significance. Projects that generate emissions below de minimis levels do not substantially contribute – individually or cumulatively – to San Francisco Bay Area Air Basin criteria air pollutants or to any current nonattainment status in the air basin.

Biological Resources

The environmental impacts to biological resources would be minimal. There are no wetlands or other features such as designated Critical Habitat potentially subject to the jurisdiction of regulatory agencies, such as the United States Army Corps of Engineers or the United States Fish and Wildlife Service (USFWS), present on the Proposed Action site. The Proposed Action site is not within or contiguous to any USFWS designated Critical Habitat for any species, including the Alameda whipsnake. In support of that determination, informal consultation with the USFWS verified that there would be no potentially adverse impacts to the Alameda whipsnake. The project has been designed with a minimum setback of at least 24 meters (80 feet) from Cafeteria Creek (to the east of the project site). In addition, construction-phase Best Management Practices and SPFs would minimize the potential for accidental discharges of fill or other materials into jurisdictional waters and sensitive habitats in the surrounding area. The vegetation types that would be removed from the Proposed Action site are common throughout the Oakland-Berkeley hills and are predominantly non-native species. The utility improvements would be constructed within LBNL road rights of way and on the substation site where biological resources are not present.

Construction Traffic Accidents:

The Proposed Action would not change the physical characteristics of the street network on the site or along the designated truck route on public roads. Construction traffic generated by the Proposed Action would be controlled by the LBNL Site Construction Coordinator and would be maintained below impact thresholds with respect to local traffic and pavement conditions. There would not be a considerable increase in construction truck traffic; therefore, no substantial increase in potential for traffic accidents compared to existing conditions.

Cultural Resources:

Under the Proposed Action, impacts to Cultural Resources would be minor. The DOE and the California State Historic Preservation Officer have determined that no archaeological resources or historic properties would be affected by the Proposed Action. However, if archaeological resources were discovered during construction, LBNL SPFs CUL-3 and CUL-4, which are included in the Proposed Action, would require measures (as appropriate), including work stoppage, oversight by accredited cultural resources professionals, and Native American tribal notification and involvement.

Greenhouse Gases:

The impact from the Proposed Action's greenhouse gas emissions (GHG) would be minor. The construction and operation of the CRT facility would generate GHG emissions, which would contribute to potential cumulative impacts on global climate. The Proposed Action's direct (Scope 1) emissions of 635 Metric Tonne Carbon Dioxide Equivalent ($MTCO_2e$) would not exceed the threshold of 25,000 $MTCO_2e$ proposed by the CEQ. The threshold CEQ proposed does not determine whether the impact of a project would be substantial; however, the proposed threshold suggests that a project that generates emissions below this number does not represent a major emitter of GHGs, and thus the Proposed Action would not qualify as a major emitter. The new GHG thresholds adopted by the BAAQMD on June 2, 2010, do not apply to this project as the project review was commenced much before the District's adoption of the thresholds. Furthermore, the CRT facility incorporates features that would substantially lessen its contribution to GHG emissions and global climate change. In compliance with the UC Policy, the Proposed Action incorporates numerous design features that are also consistent with State of California Assembly Bill 32 goals and strategies, and with GHG reduction measures suggested in the BAAQMD guidelines. These features would reduce the Proposed Action's GHG emissions by substantially more than 29 percent compared to "business-as-usual" emissions that would result in the absence of these design features.

Geology and Soils:

Impacts related to geology and soil would be minor under the Proposed Action. The Proposed Action site is located within the Earthquake Fault Zone defined for the Hayward fault by the State of California pursuant to the Alquist-Priolo Earthquake Fault Zoning Act. However, a fault investigation did not identify any active fault traces at the CRT building site. Although conformance to the highest seismic provisions does not guarantee the prevention of structural damage in the event of a maximum credible earthquake, structures built in compliance with the seismic requirements may reasonably be expected to avoid collapse or loss of life in a major earthquake.

Hazards, Human Health, and Accidents:

Potential impacts of hazardous materials, hazardous waste, and other hazards would be minor. There is no known existing subsurface contamination at the Proposed Action site. Except as discussed below, the CRT facility operations would not involve the routine use, storage, or transport of hazardous materials. A non-chemical treatment system would be used to control scaling in the facility's cooling towers. The only hazardous materials on site would be battery acid in batteries used to provide backup power to operate the computers in the event of a power outage, and about 1,000 gallons of diesel. Compliance with applicable federal, state, and local regulations would minimize exposure to hazards during operation.

Noise:

Noise impacts from construction, as well as operation of the Proposed Action, are expected to be minimal. With respect to the construction phase of the Proposed Action, calculations demonstrate that noise from CRT construction activities would not exceed City of Berkeley Noise Ordinance limits for almost the entire duration of project construction. The project's operational traffic would not make an appreciable difference to those existing noise levels along roadways that would provide access to the project site. Also, other sources of operational noise associated with the Proposed Action (cooling towers and air handling units) would not add to the noise levels experienced by any nearby sensitive receptors (most notably, the Nyingma Institute on Hearst Avenue) because noise levels generated by the Proposed Action's stationary equipment would meet the City's ordinance limits at the LBNL property line with the Institute. The operation of the CRT facility would therefore neither violate community noise standards for stationary source noise nor substantially increase the existing levels of noise at the nearest sensitive receptors.

Population and Housing, Socioeconomics, and Environmental Justice:

There would be no impacts to population and housing due to the Proposed Action. The proposed CRT facility would accommodate approximately 300 employees. Approximately 250 employees would be UC LBNL staff. Of those, 70 would be relocated from OSF, 165 would be relocated from within the LBNL site, and 15 could be new staff. Approximately 50 of the 300 employees would be UC Berkeley staff and students relocated from the Berkeley campus. The increase of 135 employees would not add substantially to the total population within the Bay Area. Given the distance between the LBNL site and the OSF, it is unlikely that many, if any, of the staff relocating from OSF would relocate their place of residence for commuting purposes. In addition, the Proposed Action would not result in environmental effects or human health risks that could affect minority or low-income populations in the surrounding area.

Public Services:

There would be no impact to public services under the Proposed Action. The CRT facility would be built to all currently applicable codes and would provide emergency access as required under applicable laws and regulations. Furthermore, the increase of 135 employees to the LBNL site under the Proposed Action would represent a small percent of the average daily population of around 4,515 at the LBNL site. Based on the historic average of calls for police services (approximately 10 calls per year), 135 additional employees associated with the Proposed Action would not cause a noticeable increase in the number of calls for police services.

Transportation and Traffic:

The Proposed Action would not substantially impact area transportation and traffic levels. Construction could result in temporary and minor impacts related to truck trips, material staging, construction worker commute trips, and parking. Traffic impacts were analyzed at project specific and cumulative levels; the latter analysis was based on a comprehensive examination of other current, planned, and pending projects in the area. Intersection delay and Level of Service (LOS) results for AM and PM peak hours under the Near-Term No Project and With Project conditions show the traffic associated with the CRT facility would not cause an exceedance of locally established significance thresholds for traffic impacts.

Utilities and Waste Management:

Impacts to utilities and waste management would be minor. There is sufficient treatment capacity at East Bay Municipal Utility District's (EBMUD) wastewater treatment plant to accommodate wastewater from the Proposed Action. EBMUD has also indicated that it can provide projected water service to LBNL from its existing supply sources. Therefore, EBMUD can meet the demands for water supply and wastewater treatment associated with the Proposed Action. The existing LBNL storm water drainage facilities have adequate capacity to service existing and future development in the area. The design features include a series of subsurface hydromodification vaults that would be sized to hold peak storm flows and release storm water discharge at a rate no greater than the pre-development condition. The electricity for the Proposed Action would be routed through the Grizzly Peak substation and transmission facilities within the LBNL site.

Water Resources:

Impacts to water resources from the Proposed Action would be minor. Since the Proposed Action would not involve groundwater withdrawal or intrusion, it would not result in any effects on groundwater supplies. Due to the steep slope and relatively clay-rich soils, the site is not an area of significant groundwater recharge under existing conditions, so the potential for new, impervious surface created by the Proposed Action to interfere with groundwater recharge would be low. Furthermore, the Proposed Action would infiltrate storm water to the maximum extent practicable. Groundwater flow paths that do exist at the site are unlikely to be affected, as the building would extend a maximum of 25 feet below the ground surface, above the level at which groundwater is typically observed near the site. A wide array of construction-phase storm water best management practices (BMPs) would be employed to minimize the potential for accidental discharges of fill or other materials into surface waters and to comply with National Pollutant Discharge Elimination System requirements. Active management of construction-related stormwater flows from development sites is a part of LBNL standard contract specifications on all construction projects undertaken by the UC.

Visual Resources:

There would be minimal impact on visual resources as a result of the Proposed Action. The facility to be developed under the Proposed Action would be largely screened by intervening topography, vegetation, and structures. From off-site viewpoints, the facility would appear as an incremental addition to the currently developed hillside. Due to surrounding topography, structures, and vegetation, the building would not be prominently visible from many off-site locations. Intervening topography would obstruct views of the building from locations in Strawberry Canyon to the southeast of the project.

DETERMINATION: Based on the analyses of the EA, and after careful consideration of all public and agency comments, the DOE has determined that the Proposed Action does not constitute a major Federal action that would significantly affect the quality of the human environment within the context of NEPA. Therefore, preparation of an EIS is not required.

PUBLIC AVAILABILITY OF EA AND FONSI: The EA, FONSI, and EA references may be reviewed and copies of the documents obtained from:

U.S. Department of Energy
Berkeley Site Office
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS 90-1023
Berkeley, CA 94720
Phone: (510)-486-7909

The EA and FONSI may also be reviewed at the City of Berkeley Public Library:

Library Director
Berkeley Public Library
Central Branch
2090 Kittredge
Berkeley, CA 94704

The document and references can also be viewed on the following website:

http://www.lbl.gov/Community/CRT/index.html

INFORMATION ON THE NEPA PROCESS: For further information on the NEPA process, contact:

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Issued at Berkeley, California, this 25th day of February 2011.

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1.0 SUMMARY

This Environmental Assessment (EA) has been prepared by the U.S. Department of Energy (DOE) in compliance with the National Environmental Policy Act of 1969 (NEPA), 42 USC 4321 et seq., to evaluate the potential environmental consequences associated with the DOE proposal to relocate and consolidate DOE Office of Science (DOE SC) Advanced Scientific Computing Research (ASCR) - funded Lawrence Berkeley National Laboratory (LBNL) programs with other University of California (UC or University) LBNL/UC Berkeley programs focusing on computational and computer science research in a new facility on the LBNL site.

The LBNL site is an approximately 80-hectacre (200-acre) site owned by the Board of Regents of the University of California and located adjacent to the UC Berkeley campus in the Berkeley-Oakland hills. The LBNL site includes research and support buildings and structures, which are primarily part of LBNL, a federally funded research and development center managed and operated by the University of California for the DOE. Throughout this document, the acronym "UC LBNL" is used to identify the University as the entity operating LBNL facilities. In addition, the DOE employees, University of California employees work at the LBNL site.[1] These employees are referred to as UC LBNL employees.

1.1 PROPOSED ACTION

The Proposed Action comprises the following:

- Relocation of the National Energy Research Scientific Computing Center (NERSC) national user facility from its existing location at the Oakland Scientific Facility (OSF), a leased building in downtown Oakland, to a new building on the LBNL site. NERSC provides high-performance computing (HPC) for research sponsored by the DOE SC. The facility houses two supercomputers, a number of additional computing systems, associated data storage systems, and support staff. The Proposed Action would relocate some of the existing HPC systems and data storage systems from the OSF to a new building on the LBNL site. This relocation is necessary because the existing OSF will not have adequate space to accommodate two future supercomputing systems at one time and will not have adequate mechanical space and electrical service capacity to handle the growth in computing facilities that is projected for NERSC.

- Relocation and consolidation of ASCR-funded LBNL programs, which include NERSC and the Computational Research Division (CRD) of LBNL, in the same new building. In addition, the joint UC Berkeley/LBNL Computational Science and Engineering (CSE) program,[2] a related program that

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1 The LBNL also includes a number of leased properties such as the Potter Street facility in Berkeley and the Oakland Scientific Facility in Oakland. The phrase "LBNL site" is used throughout this EA to refer to the approximately 80-hectacre (200-acre) LBNL site and not other LBNL leased properties.

2 CSE is a UC Berkeley and LBNL collaborative program, which is not ASCR funded but includes some UC Berkeley faculty, students and postdoctoral researchers who conduct research funded by ASCR.

is focused on computational and computer science research, would use a small portion of the new building. The relocation and consolidation of NERSC, CRD, and CSE is proposed in order to centralize and co-locate all similar and related functions and programs to improve efficiency and productivity and foster intellectual exchanges. This would involve relocating the offices of CRD staff (about 165 persons) who are currently in the Building 50 complex on the LBNL site, NERSC staff at OSF (about 70 persons), and University of California Berkeley campus (UC Berkeley)/LBNL CSE staff (about 50 persons) into the new building.

- Relocation of LBNL staff from other buildings on the LBNL site into the space that would be vacated by the CRD staff in the Building 50 complex. This would involve moving the offices of approximately 165 persons from their current locations on the LBNL site into the Building 50 complex. This relocation is required to address the current overcrowding in the LBNL buildings. This backfilling of vacated space would not involve any new hires, and therefore the backfilling action would not increase LBNL site's on-site population.

The programs would be relocated into a new three-story building and associated infrastructure that would be constructed at the LBNL site by the University. The new building would be called the Computational Research and Theory (CRT) facility. The University would be responsible for the maintenance and operation of the facility.

The new building to house these relocated programs and computational equipment would be located in close proximity to the UC Berkeley campus in order to foster collaboration between UC Berkeley and UC LBNL CRD and NERSC staff.

The overall purpose of the Proposed Action is to support the DOE SC mission in Computational Research and Theory by operating NERSC as the premier computing user facility for the research community, and by conducting programmatic and applied research and development in computational science, computer science, and applied mathematics.

The project need is for high performance computing space due to the immediate and projected deficiency in high performance computing space at the existing NERSC HPC facility and to remove the constraints to intellectual exchange and collaboration resulting from the dispersed locations of ASCR-funded and other related programs and researchers.

The action proposed by DOE is to relocate and consolidate ASCR-funded LBNL programs with other LBNL/UC Berkeley programs focusing on computational and computer science research in a new facility on the LBNL site. To satisfy the programmatic and space needs, as stated above, the University would construct a new building on the LBNL site. The construction of the new building would be a consequence of the DOE's Proposed Action. In order to evaluate and disclose the consequences of the Proposed Action, this EA presents not only the environmental effects of the relocation and consolidation of equipment and personnel but also from the construction, operation, and eventual removal of the building and equipment once the building and equipment reach the end of their useful lives.

The 0.91-hectare (2.25-acre) site proposed for the CRT facility is located in the western portion of the LBNL site, in the eastern hills of the cities of Berkeley and Oakland in Alameda County, California. The project site is flanked on three sides by Buildings 70 and 70A to the east, the Building 50 complex to the north, and Cyclotron Road and the Blackberry Canyon entrance gate to the west. The sloped terrain of the site drops roughly 30 meters (100 feet) from east to west and is vegetated with approximately 75 eucalyptus and a few oak and bay trees. The new three-story building would consist of an approximately 3,000-square-meter (32,000 gross square feet [gsf]) HPC floor with a high ceiling and two additional floors of office space for a total of approximately 12,980 square meters (139,700 gsf). The computer floor would consist of two 10,000-square-foot (sf) column-free spaces flanking a central 12,000-sf space with no more than four columns. The two floors above the HPC floor would provide a variety of general office, computer configuration and support, software support, videoconferencing, meeting, and visualization laboratory spaces.

Building construction would begin in early 2011 and would be completed by fall 2013. The NERSC equipment from OSF would be moved to the new building over a period of six months to a year. CRD and OSF staff would move to the new building immediately upon completion. Backfilling of vacated space in the Building 50 complex would take place over a period of six months to a year.

At the end of the new building's useful life, the building would be vacated and would be either (1) demolished and the site restored to a hillside, or (2) rebuilt to the applicable construction standards. Programs and equipment in the building at that time would be relocated to another appropriate building. If the facility were demolished, it is anticipated that there would be minimal environmental impacts. Prior to demolition, utility systems would be shut off, any potential sources of environmental contamination inside the building would be removed, and the interior contents would be removed and recycled. It is anticipated that there would be no hazardous or radioactive building waste material, conventional demolition methods would be used for demolition, and controls would be implemented to protect the workers and the environment. Prior to demolition of the building, an analysis would be conducted to verify whether environmental impacts would result from building demolition and to assess what level of further NEPA review would be appropriate. NERSC equipment that reaches the end of its useful life would be removed from the site by a licensed subcontractor.

1.2 ALTERNATIVES TO THE PROPOSED ACTION

In addition to the Proposed Action, Alternatives 1 through 4 and the No Action alternative are also evaluated in this EA.

- Alternative 1 proposes to locate the three-story CRT facility on a parking lot to the northeast of Building 54 (Cafeteria) in the western portion of LBNL. Due to the size and shape of the parking lot and the need for an HPC floor with a 3,000 gross-square-meter (32,000-gsf) footprint, the building would be constructed either as a cantilever structure or the HPC floor would be designed to fit the parking lot configuration. The site is a paved parking lot and no natural habitat exists at the site. Approximately 30 trees are present on or adjacent to the parking lot.

- Alternative 2 proposes to locate the three-story CRT facility on the UC Berkeley Richmond Field Station (RFS), approximately 8 kilometers (5 miles) away from the site. All attributes of the project program and population at this alternate location would be the same as that of the Proposed Action. The number of researchers, staff, and visitors that would be accommodated in the facility would remain the same as for the Proposed Action (about 300 persons). However, unlike the Proposed Action, which involves the relocation of about 135 persons to the LBNL site, this alternative involves the relocation of all 300 persons to the RFS site. In addition, while the Proposed Action would provide only four parking spaces (for disabled guests), implementation of Alternative 2 would include 300 parking spaces for all researchers, visitors, and guests of the facility. RFS is also not adequately served by high-speed and high-bandwidth networking nor is the electrical service to RFS adequate to serve the proposed building. This alternative would therefore require installation of DOE Energy Sciences Network (ESnet) infrastructure,[3] as well as major improvements to electrical transmission and distribution facilities, including installation of new power lines (using existing electrical poles or spare conduits) and a substation adjacent to the CRT building. In addition to the capital cost of these improvements, the extension of the ESnet infrastructure to RFS would result in an annual operating cost of approximately $850,000, a cost that would not be incurred under the Proposed Action. Unlike the Proposed Action, construction of the new facility at this site would require minimal grading since the site is flat. The site is a grassy lot that is not developed except for one small building.

- Alternative 3 proposes to relocate the NERSC supercomputers, CRD staff, and UC Berkeley/LBNL CSE staff to a University-owned site on the western edge of the UC Berkeley campus in the City of Berkeley, formerly occupied by the California Department of Health Services (DHS). Several aspects of the alternative such as the programs and total population would be the same as the Proposed Action. However, unlike the Proposed Action, which would relocate about 135 persons to the LBNL site, this alternative would relocate all 300 persons to the DHS site. Similar to the Proposed Action, this alternative would provide no parking spaces for the users of the facility, as adequate parking and transit services are available in the vicinity of this site. With the exception of ESnet infrastructure and adequate electrical supply, which would need to be installed and/or upgraded, all other utilities that exist at the site are adequate to support the demands of the CRT facility. The entire site is developed or disturbed in connection with the former use of the site and no natural vegetation exists on the site.

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3 ESnet is a high-speed computer-based communication and information-sharing network that serves the scientists working on DOE sponsored research.

- Alternative 4 proposes to lease a portion of a 47,195-gross-square-meter (508,000 gsf) building located at 6701 San Pablo Avenue, in the cities of Berkeley, Emeryville, and Oakland, and make interior tenant improvements to provide the needed office space. With respect to the HPC floor, the building does not have the floor configuration, which is required to install the supercomputers. Therefore, a new floor would be added on top of the existing building. To provide adequate cooling, cooling towers and chillers would also be constructed on top of the building. In addition, the power supply to the building would need to be increased and ESnet infrastructure would need to be installed.

  Unlike the Proposed Action, which involves the relocation of about 135 persons to the LBNL site, this alternative involves the relocation of up to 300 persons to the Alternative 4 site. The site has parking spaces for 100 cars inside the building and 300 spaces outside the building, and there is a potential to increase parking from 400 to 1,200 spaces at the site. The facility would not be secured with a fence, though users of the facility would be required to use identification badges to gain access. The entire site is developed with the building so no natural vegetation exists on the site.

- Under Alternative 5, the No Action alternative, the DOE would not relocate the ASCR-funded LBNL programs or provide new facilities for ASCR staff and existing research missions. The existing LBNL facility in Oakland would continue to be utilized and a new building would not be constructed.

1.3 SUMMARY COMPARISON OF PROPOSED ACTION AND ALTERNATIVES

The Proposed Action and each of the alternatives are analyzed for environmental effects specific to the action alone. Cumulative effects are evaluated for the Proposed Action and each alternative with respect to other known, past, present, and reasonably foreseeable actions. The impacts of the Proposed Action and the alternatives are summarized in **Table 1.0-1, Summary Table of Actions and Impacts**. The EA reflects that there would only be minor environmental effects from the Proposed Action by itself, or cumulatively when taken in conjunction with the other projects planned for the time frame of mid-2010 to late 2018.

1.4 NATIONAL ENVIRONMENTAL POLICY ACT AND RELATED PROCEDURES

NEPA, the Council on Environmental Quality NEPA regulations (40 Code of Federal Regulations [CFR] Parts 1500 to 1508), and the DOE's NEPA implementing regulations (10 CFR Part 1021) require that the DOE consider the potential environmental impacts of a proposed action before making a decision. This requirement applies to decisions about whether to relocate and consolidate ASCR-funded LBNL programs at the LBNL site.

In compliance with these requirements, this EA examines the potential environmental impacts of the Proposed Action and alternatives. This EA provides the DOE with the information needed to make an informed decision about whether the relocation and consolidation of ASCR-funded LBNL programs in a new building at the LBNL site may result in substantial adverse environmental impacts. Based on the Final EA, the DOE will either issue a finding of no significant impact (FONSI), or determine that additional study is needed in the form of a more detailed Environmental Impact Statement.

1.5 RELATIONSHIP BETWEEN THE DOE AND UNIVERSITY OF CALIFORNIA

LBNL is a federally owned facility on land leased from the Board of Regents of the University of California (The Regents). LBNL is managed and operated for the DOE by The Regents pursuant to a management and operating contract as defined in 48 CFR Subpart 17.6. The relationship between the parties is governed by the leases and the management and operating contract.

The Regents hold themselves accountable for the stewardship of the LBNL site within the State of California. The Regents require and approve the University-defined Long Range Development Plan (LRDP) and require that its approval be consistent with the University's policy that an LRDP undergo review and approval pursuant to the California Environmental Quality Act (CEQA). The Regents certified the 2006 LRDP Environmental Impact Report (EIR) and adopted the 2006 LRDP in July 2007 (LBNL 2006; LBNL 2006).[4] The 2006 LRDP is now the governing land use plan for the LBNL site.

The CRT facility that would be constructed as a consequence of the Proposed Action would be constructed by the University on University-owned land. The University determined that the CRT facility is an element of the growth projected under the 2006 LRDP, and in compliance with CEQA evaluated the building project for its environmental impacts in an EIR (SCH 2007072106)[5] that was certified in 2008 (LBNL 2008). Both the CRT EIR and the 2006 LRDP EIR are incorporated by reference in this EA.

In conjunction with the approval of the proposed CRT building project, the University incorporated several environmentally proactive measures from the 2006 LRDP EIR into the proposed building project to avoid or minimize potential environmental impacts.[6] These standard project features (SPFs) have been adopted as part of the LBNL 2006 LRDP EIR by the Regents of the University of California and are thus required of all UC LBNL activities pursuant to CEQA. The SPFs pertinent to the CRT facility are set forth in **Appendix 1** and are incorporated into and a part of the project description of the Proposed Action and alternatives. The analysis presented in this EA evaluates environmental impacts that would result from project implementation following the application of these SPFs.

4 http://www.lbl.gov/Community/LRDP/index.html

5 http://berkeleyscience.org/projects/crt/

6 LBNL 2006 Long Range Development Plan Final Environmental Impact Report (SCH No. 2000102046). July 2007.

Table 1.0-1
Summary Table of Actions and Impacts

Environmental Topic	Proposed Action and Alternatives					
	Proposed Action	Alternative 1 Cafeteria Parking Lot Site	Alternative 2 RFS Site	Alternative 3 Former DHS Site	Alternative 4 Leased Facility on San Pablo Avenue	Alternative 5 No Action
Geology and Soils	Minor impact related to seismicity, landslides, and erosion[1]	Minor impact related to seismicity and erosion[1]	Minor impact related to seismicity[1]	Minor impact related to seismicity[2]	Minor impact related to seismicity[1]	No impact
Water Resources	Minor impact to surface waters as increased site runoff would be controlled by project design	Minor impact to surface waters as increased site runoff would be controlled by project design	Minor impact to surface waters as increased site runoff would be controlled by project design	Minor impact to surface waters as there would be minimal to no increase in site runoff	No impact	No impact
Hazards, Human Health, and Accidents	Minor impact during construction and operation related to hazardous materials and emergency response	Minor impact during construction and operation related to hazardous materials and emergency response	Minor impact during construction and operation related to hazardous materials and emergency response	Minor impact during construction and operation related to hazardous materials and emergency response	Minor impact during construction and operation related to hazardous materials and emergency response	Minor impact during operation related to hazardous materials and emergency response
Biological Resources	Minor impact because construction and operation would have the potential to affect nesting birds and special-status species [1]	Minor impact because construction and operation would have the potential to affect nesting birds and special-status species [1]	Minor impact because construction and operation would have the potential to affect wetland habitat, nesting birds, and sensitive natural communities[1]	No impact	No impact	No impact

Environmental Topic	Proposed Action and Alternatives					
	Proposed Action	**Alternative 1 Cafeteria Parking Lot Site**	**Alternative 2 RFS Site**	**Alternative 3 Former DHS Site**	**Alternative 4 Leased Facility on San Pablo Avenue**	**Alternative 5 No Action**
Cultural Resources	Minor impact because there is a low potential to encounter archaeological resources at the Proposed Action site [1]	Minor impact because there is a low potential to encounter archaeological resources at the alternative site [1]	Minor impact because there is a moderate to high potential to encounter archaeological resources at the alternative site [1]	Minor impact because there is a low potential to encounter archaeological resources at the alternative site	Existing building could qualify as an historical resource	No impact
Visual Resources	Minor impact because the building would not be prominently visible from many off-site locations [1]	Minor impact because the building would not be prominently visible from many off-site locations [1]	Minor impact because the building would not be prominently visible from off-site locations	Minor impact because although the new building would be visible to the public, it would replace an existing structure in a highly urbanized area; potential beneficial impact as the alternative would likely improve the visual character of the area[2]	Minor impact because the additional story would be visible	No impact
Air Quality	Minor impact because emissions of criteria pollutants and toxic air contaminants would be generated during construction and operation of the facility[1]	Minor impact because emissions of criteria pollutants and toxic air contaminants would be generated during construction and operation of the facility [1]	Minor impact because emissions of criteria pollutants and toxic air contaminants would be generated during construction and operation of the facility[1]	Minor impact because emissions of criteria pollutants and toxic air contaminants would be generated during construction and operation of the facility[2]	Minor impact because emissions of criteria pollutants and toxic air contaminants would be generated during construction and operation of the facility[1]	Minor impact because emissions of criteria pollutants and toxic air contaminants would be generated during operation of the facility

Environmental Topic	Proposed Action	Alternative 1 Cafeteria Parking Lot Site	Alternative 2 RFS Site	Alternative 3 Former DHS Site	Alternative 4 Leased Facility on San Pablo Avenue	Alternative 5 No Action
	Proposed Action and Alternatives					
Greenhouse Gases	Minor impact because construction and operation of the facility would generate greenhouse gases (21,810 CO_2-equivalent metric tons [$MTCO_2e$] per year) [3]	Minor impact because construction and operation of the facility would generate greenhouse gases (21,810 $MTCO_2e$ per year)	Minor impact because construction and operation of the facility would generate greenhouse gases (22,343 $MTCO_2e$ per year)	Minor impact because construction and operation of the facility would generate greenhouse gases (21,955 $MTCO_2e$ per year)	Minor impact because construction and operation of the facility would generate greenhouse gases (22,151 $MTCO_2e$ per year)	Minor impact because operation of the facility would generate greenhouse gases (11,325 $MTCO_2e$ per year)
Noise	Minor impact because construction and operation of the facility would not substantially increase noise at the nearby sensitive receptors[1]	Minor impact because construction and operation of the facility would not substantially increase noise at the nearby sensitive receptors[1]	Minor impact because construction and operation of the facility would not substantially increase noise at the nearby sensitive receptors.	Nearby residential receptors would experience high noise levels during construction[2]	Nearby residential receptors would experience high noise levels during construction	No impact
Transportation and Traffic	Minor impact because construction and operation of the facility would add trips that would not degrade intersection operations	Minor impact because construction and operation of the facility would add trips that would not degrade intersection operations	Minor impact because construction and operation of the facility would add trips that would not degrade intersection operations	Level of service at City of Berkeley intersections would degrade[2]	Level of service at City of Berkeley intersections would degrade	No impact
Utilities and Waste Management	Minor impact because operation of the CRT facility would increase demand for utilities [1]	Minor impact because operation of the CRT facility would increase demand for utilities[1]	Minor impact because operation of the CRT facility would increase demand for utilities	Minor impact because operation of the CRT facility would increase demand for utilities	Minor impact because operation of the CRT facility would increase demand for utilities	No impact

Environmental Topic	Proposed Action and Alternatives					
	Proposed Action	**Alternative 1 Cafeteria Parking Lot Site**	**Alternative 2 RFS Site**	**Alternative 3 Former DHS Site**	**Alternative 4 Leased Facility on San Pablo Avenue**	**Alternative 5 No Action**
Public Services	No impact	No impact	No impact	No impact	No impact	No impact
Population and Housing, Socioeconomics and Environmental Justice	Minor impact because the Proposed Action would not result in environmental effects or human health risks that could affect minority or low-income populations near the site	Minor impact because the alternative would not result in environmental effects or human health risks that could affect minority or low-income populations near the site	No impact	Minor impact because the alternative would not result in environmental effects or human health risks that could affect minority or low-income populations near the site	Minor impact because the alternative would not result in environmental effects or human health risks that could affect minority or low-income populations near the site	No impact
Construction Traffic Accidents	No impact	No impact	No impact	No impact	No impact	No impact

1 *The Proposed Action includes standard project features (SPFs) required by the LBNL 2006 Long Range Development Plan Environmental Impact Report and compliance with LBNL standard operating procedures, best practices, and standard construction specifications that would reduce or avoid potential effects.*

2 *Alternative 3 includes standard practices required by the UC Berkeley 2020 Long Range Development Plan Environmental Impact Report that would avoid or reduced potential effect.*

3 *The CO2 equivalent emissions are commonly expressed as "metric tons of carbon dioxide equivalent ($MTCO_{2}e$)." The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated global warming potential (GWP), such that $MTCO_{2}e$ = (metric tons of a GHG) x (GWP of the GHG). For example, the GWP for methane is 21. This means that emissions of one metric tons of methane are equivalent to emissions of 21 metric tons of CO2.*

2.0 PURPOSE AND NEED

2.1 PURPOSE AND NEED

The project purpose is: to relocate and consolidate Advanced Scientific Computing Research (ASCR)-funded Lawrence Berkeley National Laboratory (LBNL) programs with other LBNL/University of California (UC) Berkeley programs focusing on computational and computer science research in a new facility on the LBNL site; to enable the continued operation and future advancement of the LBNL National Energy Research Scientific Computing Center (NERSC) high-performance computing (HPC) national user facility and the Computational Research Division (CRD) program; to co-locate a portion of the joint LBNL/UC Berkeley Computational Science and Engineering (CSE) program[1] with NERSC and CRD; to foster interaction and collaboration between the NERSC staff and other LBNL and UC Berkeley researchers; and provide NERSC, CRD, and CSE staff with convenient access to other LBNL scientific facilities, programs, researchers, and services.

The project need is for high performance computing space due to the immediate and projected deficiency in high performance computing space at the existing NERSC HPC facility and to remove the constraints to intellectual exchange and collaboration resulting from the dispersed locations of ASCR-funded and ASCR-related programs and researchers.

2.2 BACKGROUND

The U.S. Department of Energy's (DOE's) overarching mission is to advance the national, economic, and energy security of the United States and to promote scientific and technological innovation in support of that mission. To advance its mission, the DOE has established several national laboratories, including LBNL at the Berkeley site.

The charge of the DOE's ASCR program is to discover, develop, and deploy the computational and networking tools that enable researchers in the scientific disciplines to analyze, model, simulate, and predict complex phenomena important to the DOE. ASCR-funded programs at LBNL include (1) the NERSC facility, (2) the Energy Sciences Network (ESnet), and (3) research projects within the CRD. The joint UC Berkeley/LBNL CSE program conducts related research focused on computational and computer science areas. The following discussion presents the mission of each of these programs and their interrelationships with one another.

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1 CSE is a UC Berkeley and LBNL collaborative program that conducts research focused on computational and computer science areas. The program is not ASCR funded but includes some UC Berkeley faculty, students, and postdoctoral researchers who conduct research funded by ASCR.

2.2.1 National Energy Research Scientific Computing Center

NERSC is a premier HPC national user facility currently located in Oakland at the Oakland Scientific Facility (OSF). The DOE Office of Science (SC) relies on NERSC as the primary provider of computing and storage services to the vast majority of computational scientists funded by the DOE SC. NERSC's mission is to accelerate the pace of scientific discovery in the DOE SC community by providing high performance computing, information, data, and communications services.

NERSC provides HPC systems that enable computational science at a scale large enough to meet needs of universities, government laboratories, and international research facilities via extremely fast fiber optics networks. With this capability, national and international interdisciplinary teams of scientists explore fundamental scientific and engineering problems that require massive unclassified scientific computer simulation and data analysis calculation. In November 2003, the DOE SC ranked NERSC as one of its top 11 most important scientific facilities to ensure the U.S. retains its primacy in critical areas of science and technology well into the future.[2]

In order to meet an ever-increasing demand for such computing capabilities, NERSC must continually upgrade its computing systems in a seamless manner (i.e., with no lengthy downtime between upgrades). NERSC’s ongoing operational plan is to replace one of the existing systems approximately every three years while maintaining user access to the other existing systems. To do this, NERSC requires space for at least two fully operational HPC systems to allow one to undergo replacement or upgrade while the other system is used by scientific researchers. To house these two HPC systems, there should be two 10,000-square-foot (sf) column-free spaces flanking a 12,000-sf space, which is required for large amounts of archival data storage, high-performance intermediate storage, smaller computing clusters, and visualization servers. NERSC supercomputers are currently housed in a 19,000-sf computer room in off-site leased space at LBNL’s OSF, which also provides limited staff office space. Neither the computer room space, the mechanical equipment space, nor the available electrical power is adequate for future generations of high-performance computers.

2.2.2 Computational Research Division

The DOE SC’s computational science mission relies on the basic and applied research within CRD in the development of algorithms, computer systems software, data management tools, and the evaluation of HPC architectures. The CRD mission is to create computational tools and techniques by conducting applied research and development in computer science, computational science, and applied mathematics.

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2 *Facilities for the Future of Science: A Twenty-Year Outlook;* http://www.er.doe.gov/Scientific_User_Facilities/History/20-Year-Outlook-screen.pdf

CRD is located on the LBNL site. CRD also contains the ESnet department, which provides the high-performance scientific data network across the DOE complex.

CRD and NERSC have a synergistic relationship, with CRD research informing NERSC on what types of systems, software, and algorithms might be effective in future deployments at NERSC, while the experience of users and system support staff at NERSC reveals research challenges in computing and mathematics and suggests new research challenges for CRD. Close collaboration and frequent communication between NERSC and CRD benefits both organizations and thus DOE in the quality and effectiveness of the two programs.

Computational Science and Engineering Program

The CSE program was jointly created by LBNL and UC Berkeley, and is currently located on the UC Berkeley campus. Computational science research in areas like biology, chemistry, energy science, nanotechnology, climate modeling, and physics are interdisciplinary and interactive. Teams of researchers often involve scientists from one of these disciplines along with applied mathematicians and computer hardware and software experts to address the most challenging research questions. The CSE program brings these researchers into a common organizational structure for planning and coordination of research activities, along with a graduate curriculum to train the next generation of scientists.

The CSE program contains computer scientists and applied mathematicians who interact regularly with CRD and NERSC staff and scientists across the UC Berkeley campus who use high-end computing in their daily research. Frequent contact and communication between people working on diverse projects is vital for innovation and the sharing and "cross-fertilization" of ideas.

CSE is a UC Berkeley and LBNL collaborative program, which is not ASCR funded, but includes some UC Berkeley faculty, students, and postdoctoral researchers who conduct research funded by ASCR. By co-locating in one facility, the ASCR-funded CRD and NERSC researchers and CSE researchers would engage in mutually beneficial collaborations that bring large teams together to address important computational and computer science research areas such as climate modeling, computational cosmology, combustion research, and chip design for scientific applications.

Existing and Projected Challenges

While the NERSC computers and staff are located in Oakland, the CRD staff is located on the LBNL site, and CSE researchers are located on the UC Berkeley campus, dispersed in multiple buildings in individual and group workspaces that are inadequate in both size and functionality. This limits the opportunities for frequent interaction and collaboration. These obstacles to collaboration are anticipated to continue in the future.

As a result of the aforementioned challenges, there is an immediate and long-term need to increase computer floor space, to improve workspace size and functionality for both individual and group efforts, and to co-locate CRD staff and some CSE researchers adjacent or nearby to the NERSC. A facility or facilities that bring people and systems together in space designed for functionality and collaboration would result in improved efficiency and productivity, as well as foster intellectual exchanges. Such a facility or facilities should also provide:

- Integrated and appropriately designed space that houses and enables the continued operation and future advancement of LBNL's NERSC HPC national user facility, CRD, and joint LBNL/UC Berkeley CSE programs;
- Adequate space, chilling capacity, and infrastructure to accommodate next-generation computing equipment allowing for continual future upgrades to such equipment;
- Access to a large, reliable, and economical electrical power source. The power source should be capable of serving both the immediate and potential future needs of LBNL's computing program;
- Ability to connect the facility to modern fiber optics that can economically be connected to the existing high-speed DOE ESnet Bay Area Metropolitan Area Network;
- Convenient access to other LBNL scientific facilities, programs, researchers, and services; a location that fosters interaction and collaboration between the NERSC staff and others, including UC Berkeley researchers.

The DOE therefore proposes to relocate and consolidate ASCR-funded LBNL programs with other LBNL/UC Berkeley programs focusing on computational and computer science research in a new facility on the LBNL site. The Proposed Action includes the relocation of the NERSC HPC national user facility, the relocation, and consolidation of all NERSC and CRD staff, and the creation of a collaborative space for the joint UC Berkeley/LBNL CSE program. Housing these activities in the same new building as the supercomputing systems would centralize and co-locate all similar and related functions and programs to improve efficiency and productivity and foster intellectual exchanges and collaboration. The location for the new building to house these relocated programs and computational systems should be in close proximity to the UC Berkeley campus to enable extensive collaboration of CSE staff with NERSC and CRD staff.

3.0 PROPOSED ACTION AND ALTERNATIVES

This section describes the U.S. Department of Energy's (DOE's) Proposed Action, and alternatives to the Proposed Action, including the No Action alternative. To satisfy the programmatic and space needs of the programs to be relocated and consolidated, the University proposed to construct a new building on the Lawrence Berkeley National Laboratory (LBNL) site. The construction of the new building would be a consequence of the DOE's Proposed Action. In order to evaluate and disclose all consequences of the Proposed Action, this Environmental Assessment (EA) presents not only the environmental effects from the relocation and consolidation of equipment and personnel but also from the construction, operation, and eventual removal of the building and equipment once the building and equipment reach the end of their useful lives. It should be noted that facility design and construction details described for the Proposed Action are based on conceptual plans. The final design and schedule as ultimately approved for construction may differ from that discussed within this EA. However, the nature, scope, and environmental impacts of the Proposed Action described in this document are expected to substantially reflect and bound those associated with actual construction, operation and decommissioning of the facility.

3.1 PROPOSED ACTION

3.1.1 Introduction

The Proposed Action comprises the following:

- Relocation of the National Energy Research Scientific Computing Center (NERSC) national user facility from its existing location at the Oakland Scientific Facility (OSF), a leased building in downtown Oakland, to a new building on the LBNL site. OSF is a high-performance computing (HPC) facility for research sponsored by the DOE Office of Science. The facility houses some of the world's largest supercomputers and associated data storage systems. The Proposed Action would relocate some of the existing HPC systems and data storage systems from the OSF to a new building on the LBNL site. This relocation is necessary because the existing OSF would not have adequate space to accommodate two future NERSC supercomputing systems at one time and does not have adequate mechanical equipment space and electrical service capacity to handle the growth in computing facilities that is projected for NERSC.

- Relocation and consolidation of Advanced Scientific Computing Research (ASCR)-funded LBNL programs, (including personnel and equipment), which include NERSC and the Computational Research Division (CRD) of LBNL, in the same new building. In addition, the joint UC Berkeley/LBNL Computational Science and Engineering (CSE) program,[1] a related program that is focused on computational and computer science research, would use a small portion of the new

[1] CSE is a UC Berkeley and LBNL collaborative program, which is not ASCR funded but includes some UC Berkeley faculty, students and postdoctoral researchers who conduct research funded by ASCR.

building. The relocation and consolidation of NERSC, CRD, and CSE is proposed in order to centralize and co-locate all similar and related functions and programs to improve efficiency and productivity and foster intellectual exchanges. This would involve relocating the offices of the CRD staff (about 165 persons) who are currently in the Building 50 complex on the LBNL site, NERSC staff at OSF (about 70 persons), and UC Berkeley/LBNL CSE staff (about 50 persons) into the new building.

- Relocation of LBNL staff from other buildings on the LBNL site into the space that would be vacated by the CRD staff in the Building 50 complex. This would involve moving the offices of approximately 165 persons from their current locations on the LBNL site into the Building 50 complex. This relocation is required to address the current overcrowding in the LBNL buildings. This backfilling of vacated space would not involve any new hires, and therefore the backfilling action would not increase LBNL site's on-site population.

The new building to house these relocated programs and computational systems would be located in close proximity to the UC Berkeley campus to co-locate a portion of the joint LBNL/UC Berkeley Computational Science and Engineering (CSE) program[2] with NERSC and CRD; to foster interaction and collaboration between the NERSC staff and other LBNL and UC Berkeley researchers; and provide NERSC, CRD, and CSE staff with convenient access to other LBNL scientific facilities, programs, researchers, and services. The new multi-story building and associated infrastructure would be constructed and owned by the University of California (UC or the University) and would be called the Computational Research and Theory (CRT) facility. The facility would be operated and maintained by the University.

A small portion of the Proposed Action site is located within a parcel that is currently leased to the DOE. While the CRT building footprint is not within a DOE lease parcel, the fire truck access road and cooling tower pad would be located within a portion of Lease Parcel 11. The Proposed Action would include a parcel line adjustment to modify Lease Parcel 11.

3.1.2 Location and Existing Conditions

The LBNL site is situated in the eastern hills of the cities of Berkeley and Oakland in Alameda County; it is located on approximately 80 hectares (200 acres) that are owned by the University of California, with parcels leased by the DOE (see **Figure 3.0-1, Regional Location Maps**). Existing buildings on the LBNL site are used for heavy equipment laboratories, wet and dry laboratories, office space, and other uses.

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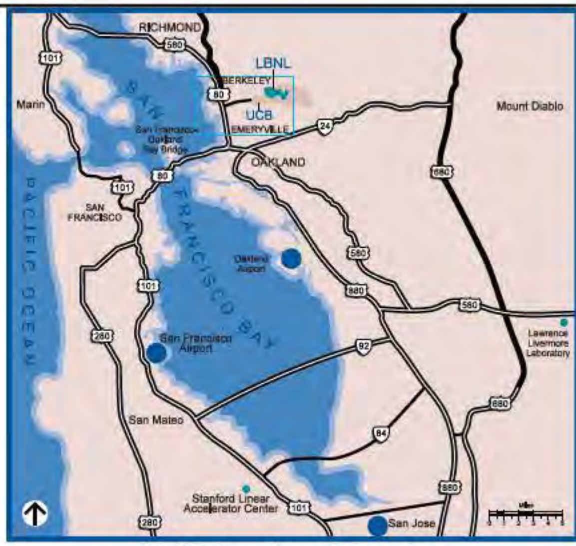
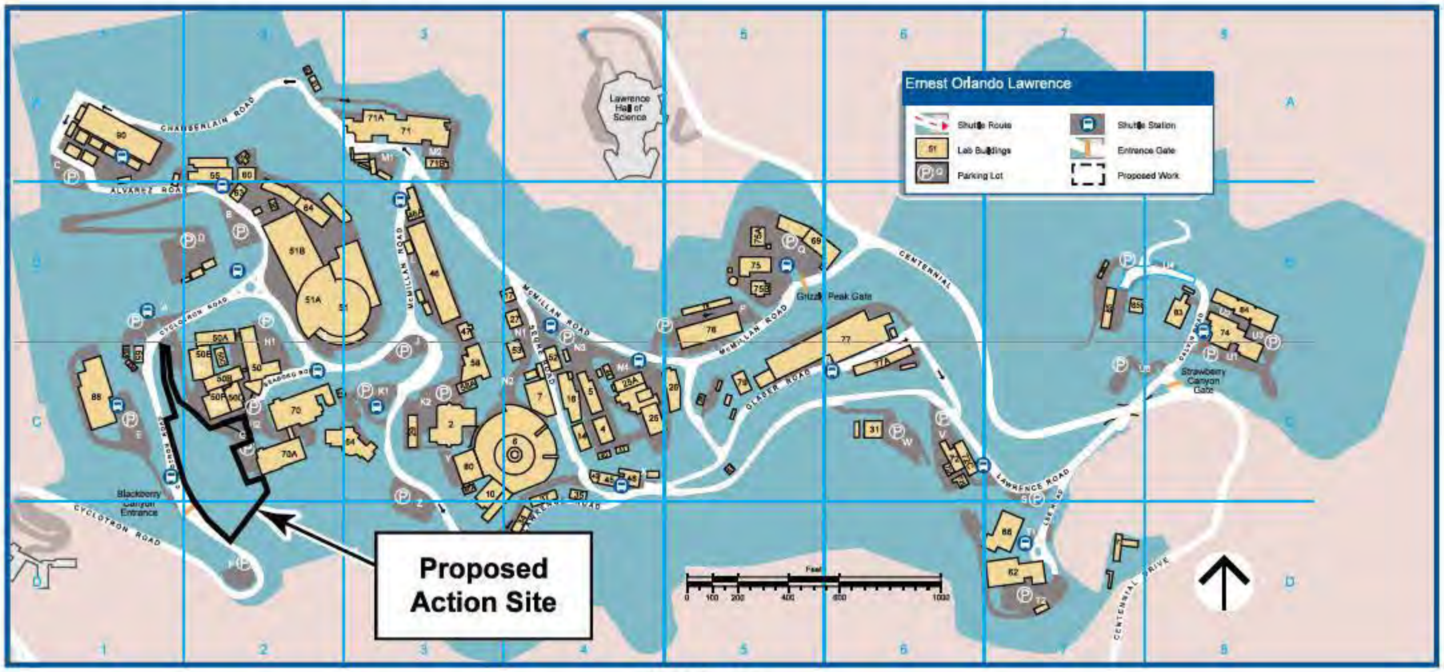
2 CSE is a UC Berkeley and LBNL collaborative program that conducts research focused on computational and computer science areas. The program is not ASCR funded but includes some UC Berkeley faculty, students, and postdoctoral researchers who conduct research funded by ASCR.



LBNL Regional Location

LBNL Local Location



NOT TO SCALE

LBNL Site

SOURCE: Lawrence Berkeley National Laboratory, 2004

FIGURE **3.0-1**

Regional Location Maps

The LBNL site is surrounded by a mix of land uses, including open space, institutional uses, and residential and neighborhood commercial areas. The main campus of the University of California, Berkeley (UC Berkeley) lies to the west, with other UC Berkeley lands, including the Strawberry Canyon open space areas, to the south and southeast of the LBNL site. Residential neighborhoods and a small neighborhood commercial area in the City of Berkeley lie to the north and northwest, and regional open space, including the Tilden Regional Park, lies to the east and northeast.

The 0.91-hectare (2.25-acre) site proposed for the CRT facility is located in the western portion of the LBNL site and is flanked on three sides by Buildings 70 and 70A to the east, the Building 50 complex to the north, and Cyclotron Road and the Blackberry Canyon entrance gate to the west (see **Figure 3.0-2, Approximate Proposed Action Site**). The Building 50 stairway currently provides pedestrian access from the Blackberry Canyon entrance gate to the Building 50 complex and Buildings 70/70A. The sloped terrain of the project site drops roughly 30 meters (100 feet) from east to west and is vegetated with approximately 75 eucalyptus and a few oak and bay trees. The site is located in an area known as Blackberry Canyon. The project site was chosen because it is in close proximity to the UC Berkeley campus. It has frontage on Chu Road and is within walking distance or a short shuttle bus trip of the Division of Mathematical and Physical Sciences and the Electrical Engineering and Computer Science Department on the UC Berkeley campus.

3.1.3 Proposed Building Design

The new three-story building would consist of an approximately 3,000-gross-square-meter (32,000-gross-square-foot [gsf]) HPC floor with a high ceiling and two additional floors of office space for a total of approximately 12,980 gross square meters (139,700 gsf) of space. The HPC floor would be a contiguous largely column-free floor to maximize flexibility in siting future supercomputer systems and would have additional height for computer system cooling flexibility. The two floors above the HPC floor would provide a variety of general office, computer configuration and support, software support, videoconferencing, meeting and visualization laboratory spaces. The building would include common areas such as a main entrance plaza and a lower-level entry plaza. The building would be approximately 18–21 meters (60–70 feet) high. The design of the new facility is planned to be energy efficient. Please see **Figure 3.0-3, Site Plan,** and **Figure 3.0-4, CRT Facility Section.**

Although the entire building would be constructed in one phase of construction, approximately 950 square meters (approximately 10,000 square feet [sf]) of the HPC floor might be shelled (i.e., no interior improvements would be made initially) and not be used initially for installation of computing systems. The interior improvements in this shelled area would be made subsequently as and when additional computing systems are needed. The interior improvements to two upper floors of the building (which would contain the offices) would be completed as part of the project construction, and the two floors would be fully occupied at initial occupancy of the building.

3.1.4 Landscaping and Tree Removal

The proposed project site would be landscaped consistent with LBNL design guidelines and standards. The landscaping would conform to and complement the existing character of planting in the project area, including the use of drought-tolerant and low water use plant materials and native trees. No lawn areas are proposed. The landscaping materials to be used in the project would also be reviewed by the LBNL Fire Marshal to ensure that fire fuel loads around the project site would not be increased as a result of project landscaping.

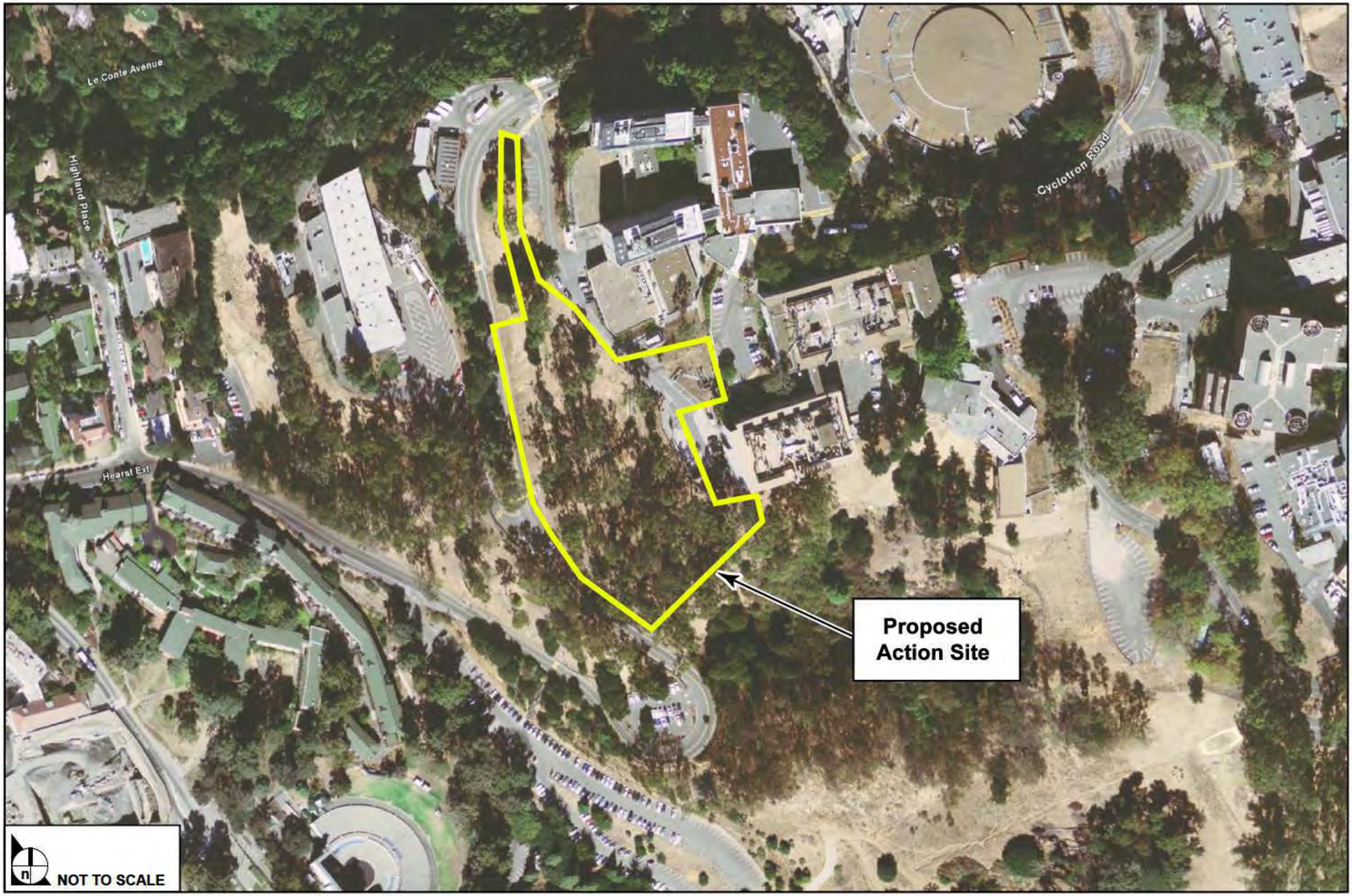
Approximately 75 trees, primarily eucalyptus, would be removed for the construction of the project. Removed trees requiring replacement under LBNL design guidelines and standards would be replaced on the project site or in other parts of the LBNL site at a 1:1 ratio.

3.1.5 Access and Parking

Automobile access to the project site would be via Cyclotron Road. Parking spaces for use by disabled visitors and employees would be provided near the proposed building. Additional limited-time parking would be provided for use by delivery and maintenance vehicles. No general use parking would be included in the project for the occupants and visitors of the proposed building. These people would use existing parking lots on the LBNL site, including the Horseshoe parking lot (Lot F) to the south and Blackberry Canyon parking lot (Lot D) to the north. Bicycle parking spaces would also be included in the proposed facility. Final design of the CRT building would provide a minimum of 32 bicycle parking spaces to further encourage bicycling and walking to the site.

3.1.6 Utilities and Infrastructure

Domestic water service (including water for fire suppression) for the CRT facility would be supplied from an existing 8-inch high-pressure water main along Seaborg Road. The existing water main would be extended to the project site to provide water service. Water consumption for the CRT facility at full occupancy is estimated at approximately 32 million gallons per year or an average of about 88,000 gallons per day (gpd). This includes demand for domestic water, fire suppression water, and cooling tower water. The proposed facility would include high-efficiency fixtures and storm water reclamation for toilet flushing and recirculation of cooling water, which would reduce water demand.

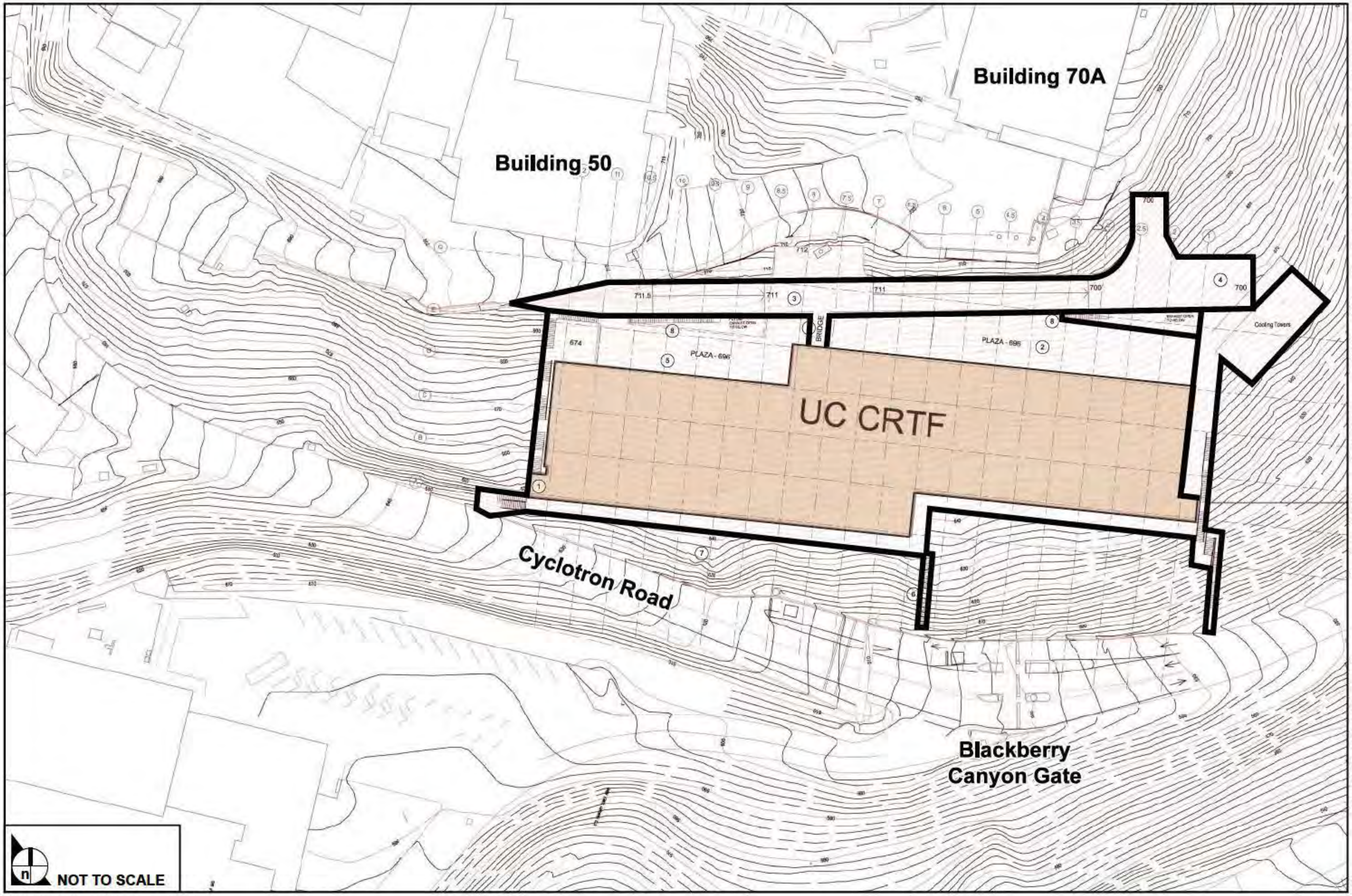


SOURCE: Google Earth - July 2007, Perkins+Will - September 2007

FIGURE **3.0-2**

Approximate Proposed Action Site

924-006•02/10

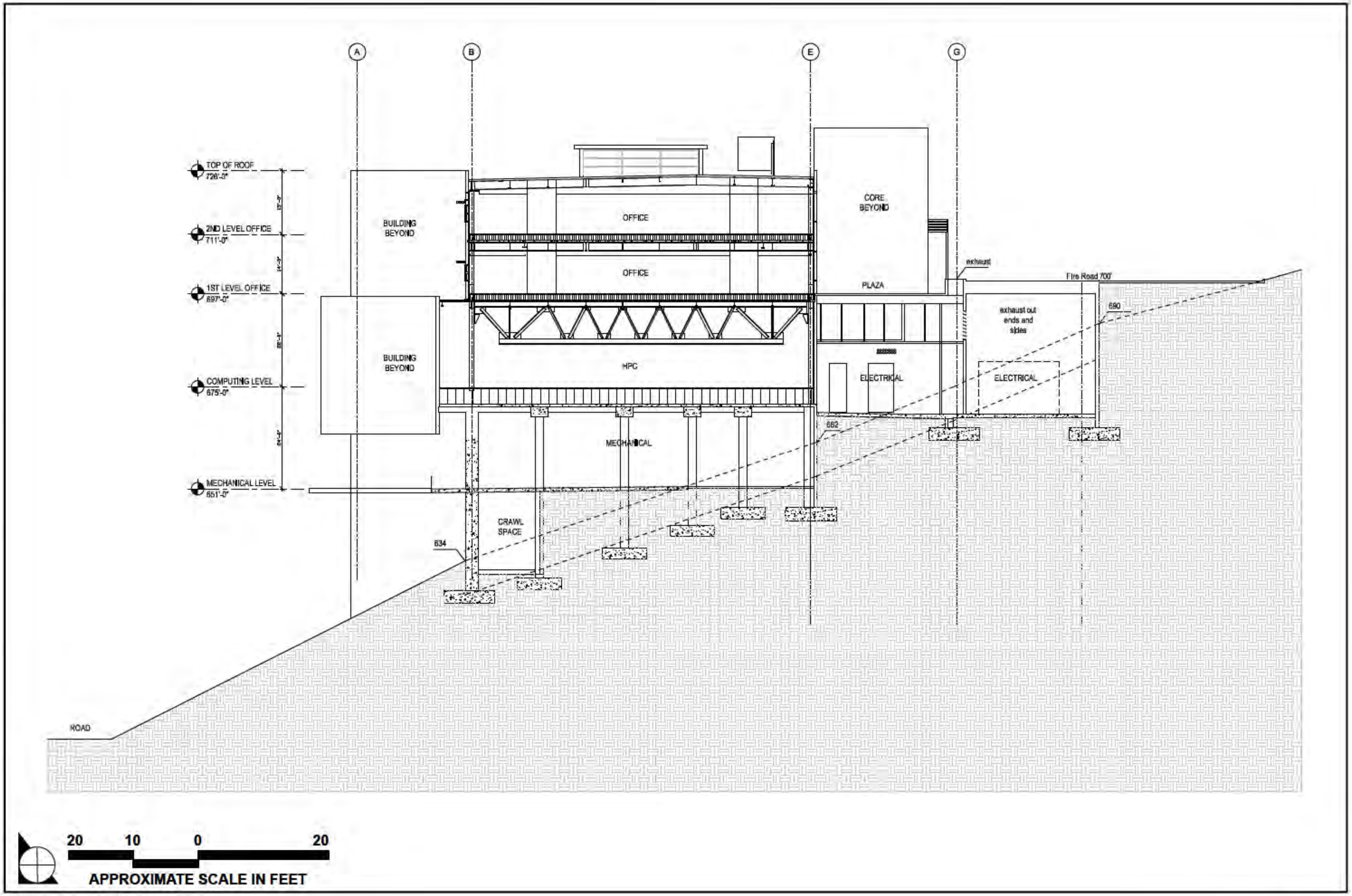


SOURCE: Perkins+Will – January 2010

FIGURE 3.0-3

Site Plan

924-006•02/10



SOURCE: Perkins & Will – January 2010

FIGURE 3.0-4

CRT Facility Section

924-006•02/10

Wastewater (sewage) generation from the facility at full occupancy is estimated at approximately 220,000 gallons per year or about 600 gpd. The project would include a connection to the existing LBNL sanitary sewer system located in Cyclotron Road. Wastewater from the western portion of the LBNL site, including the CRT site area, flows to the Hearst Monitoring Station and then into the City of Berkeley's sewer system at City sanitary sewer sub-basin 17-013. Sub-basin 17-013 is not currently constrained during peak wet weather flows.

The CRT site design would minimize the amount of impervious surfaces by limiting the footprint of the building and minimizing creation of new parking areas. The net increase in impervious surfaces for the project site would be approximately 0.6 hectare (about 1.49 acres or 65,000 sf). The storm drainage system would be constructed to control discharge and to direct flows away from Cafeteria Creek and toward on-site collection facilities. To comply with the requirements of storm water regulations, storm flows would be captured by a network of inlets, vegetated swales,[3] and drainage pipes and directed to a series of subsurface hydromodification vaults that are sized appropriately to control flows so that scour and erosion in the receiving waters is avoided.[4] An in-line pollution prevention device (such as a Continuous Deflective Separation unit or Stormceptor) would be installed within the storm drain system to control sediment and floatables from the access driveway and loading dock area in the northern portion of the project site prior to release of stormwater to the storm drain at Cyclotron Road.

HPC floor and office building cooling would be provided by a series of high-efficiency evaporative cooling towers approximately 20 feet high on a 3-foot platform located near the exterior southeast side of the HPC portion of the facility. This system would serve liquid- and air-cooled computational equipment. Initially, two cooling towers would be installed. At full project implementation, three additional cooling towers would be needed, for a total of five cooling towers. The cooling towers would operate at full capacity only during the warmest days of the year, typically in August. A small boiler with a heat input rating of approximately 0.9 million British thermal units (BTU) per hour is also proposed. Natural gas service to the boiler would be provided via a connection to the underground gas main in the Building 50/Building 70 area.

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3 Should it be determined that appropriately sized vegetated swales are not feasible, then alternative Regional Water Quality Control Board-approved methods of treating stormwater runoff, such as in-line pollution prevention devices or infiltration galleries, would be incorporated into the project. All water quality treatment and source controls would be summarized in the project-specific Storm Water Pollution Prevention Plan (SWPPP), which will be available to regulatory agencies for inspection.

4 The hydromodification vaults or stormwater pipe system would be designed such that "flow duration control" is provided between 10 percent of the two-year recurrence storm and the 10-year recurrence storm. The vaults would be oversized to allow detention of peak flows for the 25-, 50- and 100-year design storms and release at a rate no greater than the pre-development condition, or equivalent separate facilities will be incorporated to provide such control. Final design calculations showing no increases in peak runoff for the 25-, 50-, and 100-year events would be provided to and reviewed by LBNL staff upon finalization of the project design.

The project would connect to the existing electrical underground lines in the Building 50/Building 70 area for electrical service. At the time of initial building occupancy, the facility would require up to 7.5 megawatts (MW) of power; at full buildout of the project, this demand could increase to a maximum of 17 MW. All of the required electricity would come from the grid.

Modifications to the Grizzly Peak substation and transmission facilities within LBNL would be needed in order to accommodate the CRT facility's power needs. These modifications would include use of existing spare breakers at the Grizzly Peak substation, installation of new conductors from the substation to the proposed CRT building using spare conduits though an existing electrical manhole, and extension of a new duct bank from an existing manhole close to the CRT building. All modifications would be accomplished entirely within the footprint of existing utilities or within the CRT project site.

The natural gas supply for the Lab site is provided by Defense Fuel Supply Center in Oregon and delivered by the PG&E system. The LBNL natural gas system receives its supply from a 6-inch PG&E line operating at 50 pounds per square inch gauge (psig). The point of delivery is a meter vault with automatic shut off valves near the Foothill parking lot. From the point of delivery, a 6-inch medium pressure gas main provides gas service to the LBNL site. This gas main crosses the Proposed Action site from Cyclotron Road to a point between Buildings 50D and 70A. This gas line would be relocated approximately 100 feet to the north to allow construction of the proposed facility, and new connections would be established to serve the project.

Emergency electrical power would be provided by a 750-kilowatt (kW) diesel backup generator located on the ground floor of the building near the cooling towers. A second 750-kW diesel backup generator would be installed if the electrical capacity of the facility were increased. One fuel tank (belly tank) would be an integral part of each generator. A battery backup system would also be provided to ensure uninterrupted power service for computing center critical systems. The project would also connect to the existing high-speed Energy Sciences Network (ESnet) Bay Area data network using existing and new conduits on the LBNL site.

3.1.7 Chemical Use On Site

Research that would be conducted in the proposed facility would be limited to open scientific computing and computing-related operations and would not involve radioactive materials, hazardous chemicals, non-hazardous organic or inorganic materials, nano-scale materials, or genetically modified/transgenic plant materials and microorganisms. No "wet" laboratories would be located in the building. A non-chemical treatment system would be used to control scaling in the facility's cooling towers. The only hazardous material stored on site (other than materials used for custodial work) would be diesel fuel in two 500-gallon belly tanks, one for each emergency generator. Sealed batteries containing battery acid would be used on site. Batteries would be kept in racks either on the computer floor or in specially designed areas within the building and would be collected and recycled at the end of their useful lives.

3.1.8 Project Population

The proposed CRT facility would accommodate approximately 300 employees, of whom approximately 250 would be UC LBNL staff and HPC systems vendors, and 50 would be UC Berkeley staff and students. Of the approximately 250 UC LBNL staff, about 165 would be existing on-site staff relocated from the adjacent Building 50 Complex, and 70 persons would be relocated from the off-site OSF. These OSF staff members and computing systems vendors were located at the LBNL site prior to 2000 and would be returning to the LBNL site. Approximately 15 staff could be new or relocated UC LBNL staff. The CRT facility would result in the addition of approximately 135 additional persons (70 LBNL staff from OSF, 15 new or relocated UC LBNL staff, and 50 UC Berkeley staff and students) to the LBNL site.

3.1.9 Construction

Site Grading

Because of the hillside location of the proposed building, project construction would involve both cuts and fills. In addition, a shallow landslide (less than 8 feet deep)[5] underlies a portion of the building site. This landslide would be removed and replaced with compacted fill before the building is constructed. Based on the proposed design of the building, the proposed project would require approximately 11,850 cubic meters (15,500 cubic yards [cy]) of cut and off-haul and approximately 9,330 cubic meters (12,200 cy) of approved structural fill.

Schedule and Manpower

Project construction is anticipated to begin in early 2011 and end in fall 2013. Construction would take place Monday through Friday and would involve typical construction hours that extend from early morning through mid-afternoon. Construction of the project would require a workforce that would vary from about 15 to 20 construction workers at the start of construction in early 2011 to a peak of about 300 workers in fall 2012, dropping to about 20 workers in summer 2013 during the final months of construction.

Construction Traffic

Approximately 12,200 cy of structural fill would be required, which would be hauled to the project site from a storage area on the LBNL site, using existing internal LBNL roadways to transport the fill materials to the project site.

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5 Kleinfelder, Inc., 2006, Fault Investigation, Computation Research and Theory Building, Lawrence Berkeley National Laboratory, Berkeley, California, Consulting report prepared for LBNL, 44p.

Although the University is continuing to examine the possibility of storing all excess earth materials excavated at the CRT site in a storage area on the LBNL site to use as fill at other LBNL project sites, off-haul of approximately 15,500 cy of earth materials could be required. Assuming a truck capacity of 12 cy, this would result in approximately 1,290 truck trips from the CRT facility site to the disposal site and 1,290 return truck trips. These truck trips would follow the city-designated truck route (Hearst-Oxford-University Avenue) in the City of Berkeley to and from the LBNL site.

In addition to off-haul of earth materials, project construction activities would generate daily construction vehicle trips associated with delivery of construction materials and transport of construction workers to the site. There would be an average of three large delivery truck trips per day, with a peak number of 10 to 15 round trips per day, in fall 2011 associated with the delivery of concrete, rebar, form work, structural steel, mechanical and electrical equipment, exterior siding and windows, drywall and studs, pipes and conduits, roofing materials, etc. On average, there would be 1 to 5 construction worker bus trips (round trips) each day, and there would be from 10 to 50 small truck deliveries to the project site daily during the construction period. Therefore, at peak there could be up to 10 large delivery truck trips, about 50 small delivery truck trips, and 1 to 5 construction worker bus trips to the site in one day.

The 2006 LRDP EIR[6] identified existing construction management "best practices" routinely undertaken at LBNL to limit otherwise potentially adverse construction-related traffic impacts and set these forth as LBNL Best Practices 6a through 6c. The LRDP EIR identified these best practices as continuing best practices required to be incorporated into contract specifications and management oversight for all development projects under the 2006 LRDP.[7] Pursuant to LRDP Best Practice TRANS-6c, UC LBNL has instituted a program to manage construction schedules of projects to minimize the overlap of heavy truck activity periods. As a part of this program, UC LBNL makes necessary adjustments to truck movements to keep the total number of one-way truck trips on the Hearst-Oxford-University Avenue truck route

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6 http://www.lbl.gov/Community/LRDP/index.html

7 The 2006 LRDP EIR, under Impact TRANS-6 (focused on construction traffic), concluded that estimated construction truck traffic from the LBNL site including 65 one-way daily truck trips (33 trucks per day) in a peak year would not result in a significant impact to city intersections. An impact threshold for truck trips was not identified in the 2006 LRDP EIR. Since the certification of the 2006 LRDP EIR, in anticipation of concurrent construction of a number of large projects on the LBNL site, UC LBNL conducted a reevaluation of the traffic impacts associated with construction truck trips. This study, conducted by Fehr & Peers, examined the existing (2009) traffic conditions along the designated truck route from the LBNL site through the City of Berkeley to I-80, focusing on major intersections that are known to be operating at or near failing conditions. The study determined that so long as the total number of one-way truck trips from the LBNL site that pass through the Hearst Avenue, Oxford Street, and University Avenue intersections do not exceed 98 one-way truck trips per day (or 49 trucks per day) and LBNL's construction truck traffic does not exceed 50 one-way truck trips (or 25 trucks a day) through the Gayley Road/Stadium Rim Way intersection, construction traffic would result in minimal effects on city intersections. The study utilized the City's thresholds for traffic impacts that were amended after the certification of the LRDP EIR. This traffic study is incorporated by reference in this Environmental Assessment.

below 98 trips per day. Truck trips associated with the proposed project would also be governed by this LBNL site program to ensure that the project's trips—when added to truck trips from other ongoing construction projects—would not exceed the established limit.

A Construction Traffic Management Plan (CTMP) would be prepared for the proposed project, which would stipulate internal truck routes within the LBNL site and consider stacked parking or off-site parking for construction workers to minimize parking demand.

Construction Access, Parking, Staging, and Environmental Protections

Construction access to the project site would be via Cyclotron Road, Chu Road, and a new access driveway from Chu Road. Parking for construction workers would be provided off site, and buses would transport construction workers to the project site**.** As stated above, between one and five bus trips per day would be involved in the transport of construction workers.

Staging areas would be established where feasible on the project site. Due to the project's proximity to the LBNL main entrance at Blackberry Gate, the location of the staging areas would be selected so as not to interfere with or otherwise affect the Blackberry Gate. Staging areas would be fenced and enclosed. LBNL and its contractors would minimize the use of on-site storage and when necessary store building materials and equipment away from public view, and would keep activity within the project site and laydown areas.

Fencing would be installed 50 feet from the Cafeteria Creek drainage to ensure that construction activities would not inadvertently affect this area. The root systems of all large oak trees that would not be removed in conjunction with the project but are in close proximity to project construction would also be protected by installing fencing at the drip line, as required by the LBNL Capital Projects Procedures Manual (LBNL 2009).

Active management of construction-related stormwater flows from development sites is a standard part of contract specifications on all construction projects undertaken by UC LBNL. LBNL's standard construction specifications would apply to the Proposed Action. These would include requirements for:

- installation of erosion control netting and riprap to protect slopes and minimize adverse effects of runoff,
- protection of existing plant materials,
- application and maintenance of hydroseeding (sprayed application of seed and reinforcing fiber on graded slopes),
- not washing out concrete trucks into the storm drain system, and

- proper disposal of wastewater resulting from vehicle washing.

UC LBNL would also implement spill prevention and response programs to minimize pollutants in runoff. Consistent with LBNL standard construction specifications, the project site would be replanted with landscaping as soon as practicable. Given the project would require coverage under the NPDES California General Permit for Storm Water Discharges associated with Construction Site Discharges (Construction General Permit), additional control measures and best management practices might also be implemented, and would be described in the project-specific Storm Water Pollution Prevention Plan (SWPPP) that would be developed for this construction project site, as required by the Construction General Permit.

3.1.10 Building Decommissioning

At the end of the new building's useful life, the building would be vacated and would be either (1) demolished and the site restored to a hillside, or (2) rebuilt to the applicable construction standards. Programs and equipment in the building at that time would be relocated to another appropriate building. If the facility is demolished, it is anticipated that there would be minimal environmental impacts. Prior to demolition, utility systems would be shut off, any potential sources of environmental contamination inside the building would be removed, and the interior contents would be removed and recycled. It is anticipated that there would be no hazardous or radioactive building waste material; conventional demolition methods would be used for demolition, and controls would be implemented to protect the workers and the environment. Prior to demolition of the building, an analysis would be conducted to verify whether environmental impacts would result from building demolition and whether further National Environmental Policy Act (NEPA) review would be appropriate. NERSC equipment that has reached the end of its useful life would be removed from the site by a licensed subcontractor and would be recycled as appropriate.

3.1.11 Site Security

The LBNL site has a perimeter fence with three vehicle entrance points. Access to the site is controlled at the gates by security personnel who check for proper access authorization. Access control for areas within the LBNL site is provided by signage, lock and key, and/or electronic locking systems. A private security provider provides security services including access and traffic control and property protection. The UC Berkeley Police Department provides all patrol, investigation, and law enforcement services to the LBNL site. The proposed CRT building would be inside the perimeter fence of LBNL, close to the Blackberry Canyon gate. A portion of the LBNL perimeter fence intersects the southwestern corner of the proposed building and would be relocated prior to project construction to ensure that the entire facility is enclosed by the perimeter fence.

3.1.12 Emergency Preparedness

LBNL's Master Emergency Program Plan (MEPP) establishes policies, procedures, and an organizational structure for responding to and recovering from a major disaster at LBNL. The LBNL MEPP uses the National Incident Management System (NIMS) as prescribed by Homeland Security Presidential Directive 5, Management of Domestic Incidents, and the standardized Emergency Management System for managing multi-jurisdictional emergencies in California. All personnel assigned to the Emergency Operations Center are trained individually and collectively. The training focuses on the plan to address the credible emergencies at LBNL. The CRT facility would be covered by the LBNL MEPP.

3.2 ALTERNATIVES TO THE PROPOSED ACTION

In accordance with the National Environmental Policy Act (NEPA), Section 102 (2) (E), a range of reasonable alternatives as defined by the specific facts and circumstances of a proposed action must be considered by the decision makers. If alternatives have been eliminated from detailed study, the EA must briefly discuss the reasons for their elimination (40 CFR 1502.14(a)). The "No Action" alternative, which maintains existing conditions and practices on a project site in the absence of a federal action, must be included among the alternatives analyzed (40 CFR 1502.14(d)). The sections that follow present the alternatives that were carried forth for detailed analysis in this EA and those alternatives that were considered but not evaluated in detail as they were found to be infeasible.

3.2.1 Alternative 1: Cafeteria (Building 54) Parking Lot Site

Under this alternative, the proposed three-story CRT building would be located on a parking lot to the northeast of Building 54 (Cafeteria) in the western portion of LBNL site. Due to the size and shape of the parking lot and the need for an HPC floor with an approximately 2,970 gross-square-meter (32,000-gsf) footprint, the building would be constructed either as a cantilever structure or the HPC floor would be redesigned to fit the parking lot configuration. All other attributes of the proposed building at this location would be the same as under the Proposed Action. A central plant with cooling towers, a boiler, and emergency generators would be constructed and the same electrical service improvements would be installed. The same number of persons would be relocated to the new building under this alternative as the Proposed Action. The existing parking spaces at this site would be replaced with the equivalent number of spaces beneath the proposed building so that the parking supply at LBNL is not reduced. Construction at the new facility would therefore require some additional grading activities in order to construct the underground parking spaces. The site is a paved parking lot with about 30 trees in and adjacent to the parking lot. The location of the alternative site is shown on **Figure 3.0-5, Location of Alternative 1 Site.**

3.2.2 Alternative 2: Richmond Field Station Site

Under this alternative, the proposed CRT facility would be located at the UC Berkeley Richmond Field Station (RFS). The RFS is located in Richmond off Interstate 580 (I-580). The 62-hectacre (152-acre) academic teaching and research facility consists of about 100 acres of uplands and about 52 acres of marsh and bay lands. The RFS was formerly used for industrial purposes, and there is remnant contamination that has been the subject of environmental investigation and remediation over a number of years.[8] UC Berkeley is conducting additional investigations of groundwater and soil contamination to determine if more cleanup is required.

The proposed 3.2-acre CRT site at RFS would be bound by Seaver Avenue to the west, South 47th Street to the east, and two unnamed streets to the north and south. The location of the alternative site is shown on **Figure 3.0-6, Location of Alternative 2, RFS Site.** This site is an existing storage area for California Partners for Advanced Transit and Highways research vehicles. Although a building (Building 167) is present on this site, this building would not be displaced by the CRT facility, as adequate undeveloped land area is available to locate the CRT building on the site without removing this building. All attributes of the project program and population at this alternate location would be the same as that of the Proposed Action. The number of researchers, staff, and visitors that would be accommodated in the facility would remain the same as for the Proposed Action (about 300 persons). However, unlike the Proposed Action, which involves the relocation of about 135 persons to the LBNL site, this alternative involves the relocation of all 300 persons to the RFS site. This alternative would include the creation of 300 parking spaces for all researchers, visitors, and guests, unlike the Proposed Action that would provide about four parking spaces for disabled employees and visitors only and no general parking.

The RFS is not adequately served by high-speed and high-bandwidth data networking, nor is the electrical service to RFS adequate to serve the proposed building. This alternative would therefore require installation of ESnet infrastructure as well as major improvements to electrical transmission and distribution facilities, including installation of new power lines (using existing electrical poles or spare conduits) and a substation adjacent to the CRT building. In addition to the capital cost of these improvements, the extension of the ESnet infrastructure to RFS would result in an annual operating cost of approximately $850,000, a cost that would not be incurred under the Proposed Action. Similar to the Proposed Action, the RFS site is secured around all sides by chain link fencing that is at least 6 feet tall.

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8 A description of the Richmond Field Station, including past industrial activities and ongoing cleanup, can be found online at http://rfs.berkeley.edu/about.html#thefacility.

Access to the site is monitored at a guard booth by the main entrance. The site is a grassy lot with no buildings other than one small building on one side of the lot. Construction of the new facility at this site would require minimal grading since the site is flat. Given the site's bay shore location and the resultant potential for the presence of subsurface archaeological resources, as part of project implementation, an archival search would be completed prior to ground disturbance to determine appropriate locations for archaeological monitoring during site grading. Following removal of top soil, a field inspection would be conducted by a qualified archaeologist who meets the Secretary of the Interior's Standards. The archaeologist would provide recommendations for any additional steps needed to protect archaeological resources.

3.2.3 Alternative 3: Former California Department of Health Services (DHS) Site

Under this alternative, the CRT facility would be located on a University-owned site on the western edge of the UC Berkeley Campus in the City of Berkeley. The approximately 2.4-acre site covers almost the entire block defined by Oxford, Hearst, Shattuck, and Berkeley Way, and was until recently occupied by a vacant 19,974 gross-square-meter (215,000 gsf) building.[9] The location of the site is shown on **Figure 3.0-7, Location of Alternative 3, Former DHS Site.** The California Department of Health Services (DHS) was the former occupant of the building. The site has been approved by the UC Board of Regents (the Regents) for redevelopment to locate the UC Berkeley Helios Energy Research Facility, a new building that would house an energy research program. The Helios facility would be located in the northeastern quadrant of the city block adjacent to existing apartments. There are no specific projects at this time planned for the western one-half of the DHS site, although UC Berkeley anticipates that it will use the remainder of the DHS site for a community health campus. Under this alternative for the CRT facility, a new three-story CRT building with a footprint of about 2,970 gross square meters (32,000 gsf) and 11,706 gross square meters (126,000 gsf) of space and a central plant would be constructed in the western portion of the DHS site along the Shattuck Avenue frontage. Several aspects of the alternative, such as programs and total population, would be the same as the Proposed Action. However, unlike the Proposed Action, which involves the relocation of about 135 persons to the LBNL site, this alternative involves the relocation of all 300 persons to the DHS site. The alternative would provide no parking spaces, other than the required number of disabled parking spaces, for the users of the facility, as adequate parking and transit services are available in the vicinity of this site. With the exception of ESnet and electricity infrastructure, which would need to be installed, all other utilities that exist at the site are adequate to support the demands of the CRT facility. The facility would not be secured with a fence,

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9 Demolition of this building is approved as part of the UC Berkeley Helios Energy Research Project and began in April 2010.

though building access would be controlled, and users of the facility would be required to use an identification badge.

Construction of the new facility at this site would require minimal grading since the site is flat. The entire site is developed or disturbed in conjunction with its former use and no natural habitat exists on the site. The existing building on the site has been demolished by UC Berkeley in conjunction with the construction of the Helios facility.

3.2.4 Alternative 4: Leased Facility on San Pablo Avenue

Alternative 4 would involve the use of similarly situated existing facilities in and around west Berkeley, Emeryville, and Oakland for the relocation and consolidation of the three programs. For the purposes of this EA, the use of the existing building at 6701 San Pablo Avenue for CRT facility will be analyzed in detail as a representative site; it is expected that environmental impacts from the use of other nearby leased facilities would be similar to those identified in this analysis. Under Alternative 4, the University would lease a portion of the 47,195-gross-square-meter (508,000-gsf) building located at 6701 San Pablo Avenue, in the cities of Berkeley, Emeryville, and Oakland. The location of the site is shown on **Figure 3.0-8, Location of Alternative 4, Leased Facility on San Pablo Avenue.** The building has been leased by the University for other purposes for several years and is a structurally sound building. This alternative would involve interior tenant improvements to provide the needed office space. Each floor of the building includes multiple large columns, which precludes use as an HPC floor. Therefore, a new floor would be added on top of the existing building. To provide adequate cooling, cooling towers and chillers would be constructed on top of the building. In addition, the power supply to the building would need to be increased under the alternative. The alternative would also require installation of ESnet infrastructure.

Unlike the Proposed Action, which involves the relocation of about 135 persons to the LBNL site, this alternative involves the relocation of up to 300 persons to the Alternative 4 site. The site has parking spaces for 100 cars inside the building and 300 outside the building, and there is a potential to increase parking from 400 to 1,200 spaces at the site. The facility would not be secured with a fence, though users of the facility would be required to use identification badges to gain access.

The entire site is paved or under the building and no natural habitat exists at the site. There are three ornamental trees in front of the building on San Pablo Avenue. Unlike the Proposed Action, which would require construction of a new three-story facility and improvements, construction activities under this alternative would be limited to the construction of an additional floor, interior modifications, and installation of cooling equipment.

SOURCE: Impact Sciences, Inc. – February 2010

FIGURE 3.0-5

Location of Alternative 1 Site

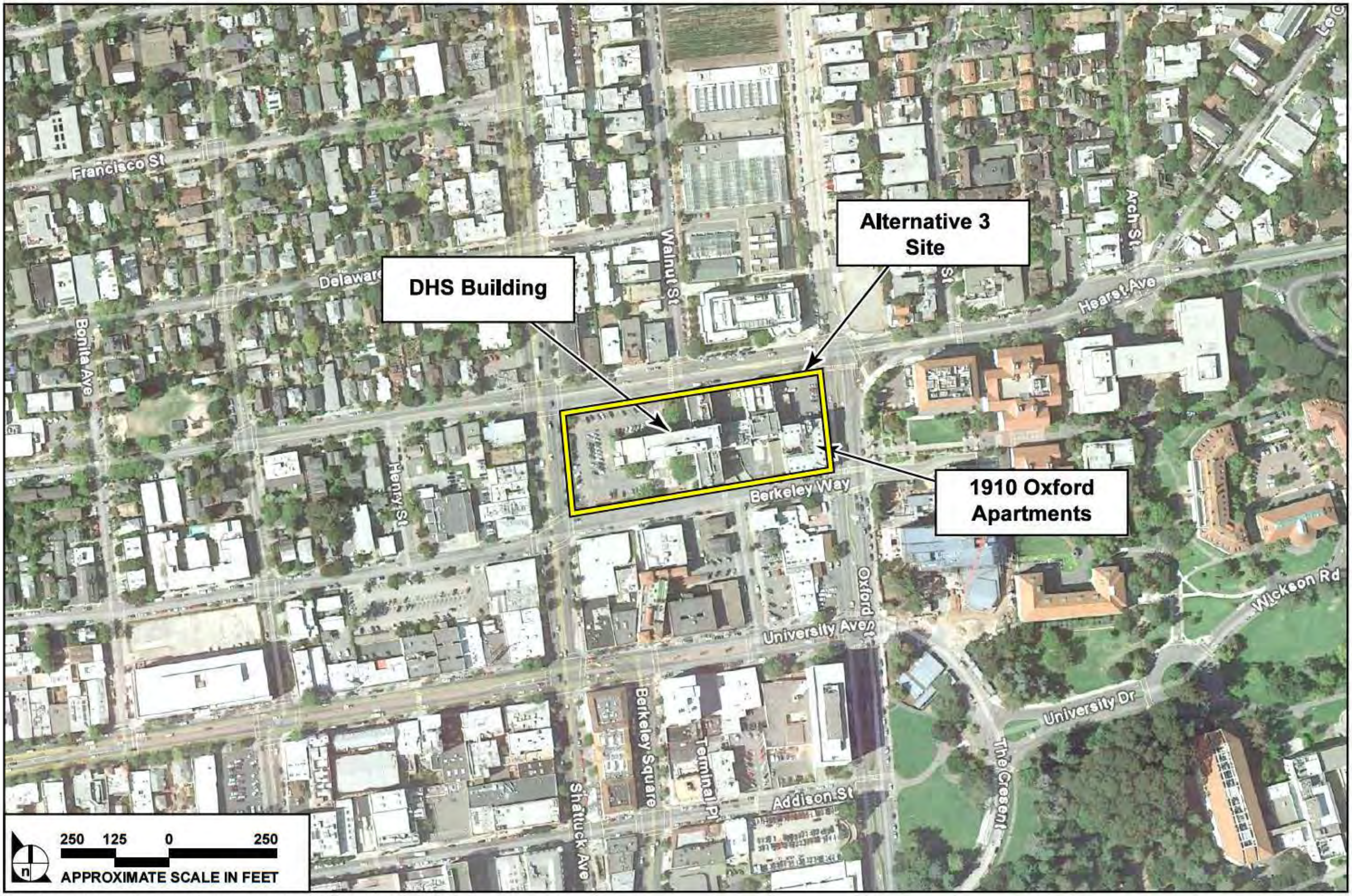
924-006•08/10

SOURCE: UC Berkeley – 2008

FIGURE 3.0-6

Location of Alternative 2, RFS Site

924-006•07/10



SOURCE: Google Earth – August 2009, Impact Sciences, Inc. – February 2010

FIGURE **3.0-7**

Location of Alternative 3, Former DHS Site

924-006•07/10

SOURCE: Google Earth – August 2009, Impact Sciences, Inc. – July 2010

FIGURE 3.0-8

Location of Alternative 4, Leased Facility on San Pablo Avenue

924-006•07/10

3.2.5 Alternative 5: No Action Alternative

The No Action Alternative was also evaluated to provide a baseline for comparison of the impacts of the Proposed Action against the impacts that would occur, if the DOE does not relocate the ASCR-funded and other related programs and researchers Under the No Action Alternative, NERSC would remain at the OSF, and a new building would not be constructed. However, the No Action Alternative fails to meet the Project purpose and need because the OSF would neither have adequate space to accommodate two future supercomputing systems at one time nor have adequate mechanical space and electrical service capacity to handle the computing facility growth projected for NERSC. As explained in **subsection 2.2.2** of this EA, this would place the programs and the continued DOE support for these programs at risk. The location of the facility is shown on **Figure 3.0-9, Location of Oakland Scientific Facility.**

3.3 ALTERNATIVES CONSIDERED BUT ELIMINATED

3.3.1 Expansion of Oakland Scientific Facility

Under this alternative, UC would continue to lease space in downtown Oakland for the OSF. To accommodate CRD, CSE, and future NERSC high performance computers and other data systems and support equipment, the building would need to be expanded by adding an extension to the existing computer room. Such an expansion is not feasible given the lack of space at the site. In addition, provision of adequate power to serve the expanded facility is challenging at this site. Although a recent project increased the OSF power capacity from 6 MW to 9 MW, expanding the electrical power supply to 17 MW is a major limitation for this site, as it will involve a very high cost to bring this additional electrical capacity to the OSF. While potential office space for the CRD division staff might be available in the existing building, the NERSC would have to be located elsewhere and therefore this alternative was rejected because it would not meet the project purpose of consolidating all ASCR-funded LBNL programs in one location.

3.3.2 Building 25 and 25A Site

Under this alternative, the new building to house the relocated NERSC and LBNL CRD staff would be constructed at the current site of Buildings 25 and 25A, near the geographical center of the LBNL site. Buildings 25 and 25A and associated ancillary buildings would be demolished. All other attributes of the proposed building at this alternate location would be the same as that of the Proposed Action. Although this site was evaluated as an alternate location for the proposed building in the Computational Research and Theory Facility EIR,[10] this site is likely no longer available for the CRT facility because other projects

10 University of California and LBNL, CRT Final EIR (SCH# 2007072106), certified February 2008.

(the General Purpose Laboratory or [GPL] and the Solar Energy Research Center) are proposed to be built at the site of Buildings 25 and 25A. Therefore, this alternative was considered infeasible and was eliminated**.**

3.3.3 Building 51 Site

Under this alternative, the new building to house the relocated NERSC, CRD staff, and CSE staff would be constructed at the current site of Building 51, near the center of the LBNL site. Building 51 and the former Bevatron accelerator housed in the building are undergoing demolition. Completion of the building and the accelerator demolition subcontract is scheduled for March 2011. However, the scope of the demolition subcontract does not include complete subsurface remediation of the site. If additional remediation beyond the scope of work for the demolition contract is required, the site could not be built on until remediation has been completed. For these reasons, this alternative was considered infeasible and was eliminated.

3.3.4 Reduced Size Alternative

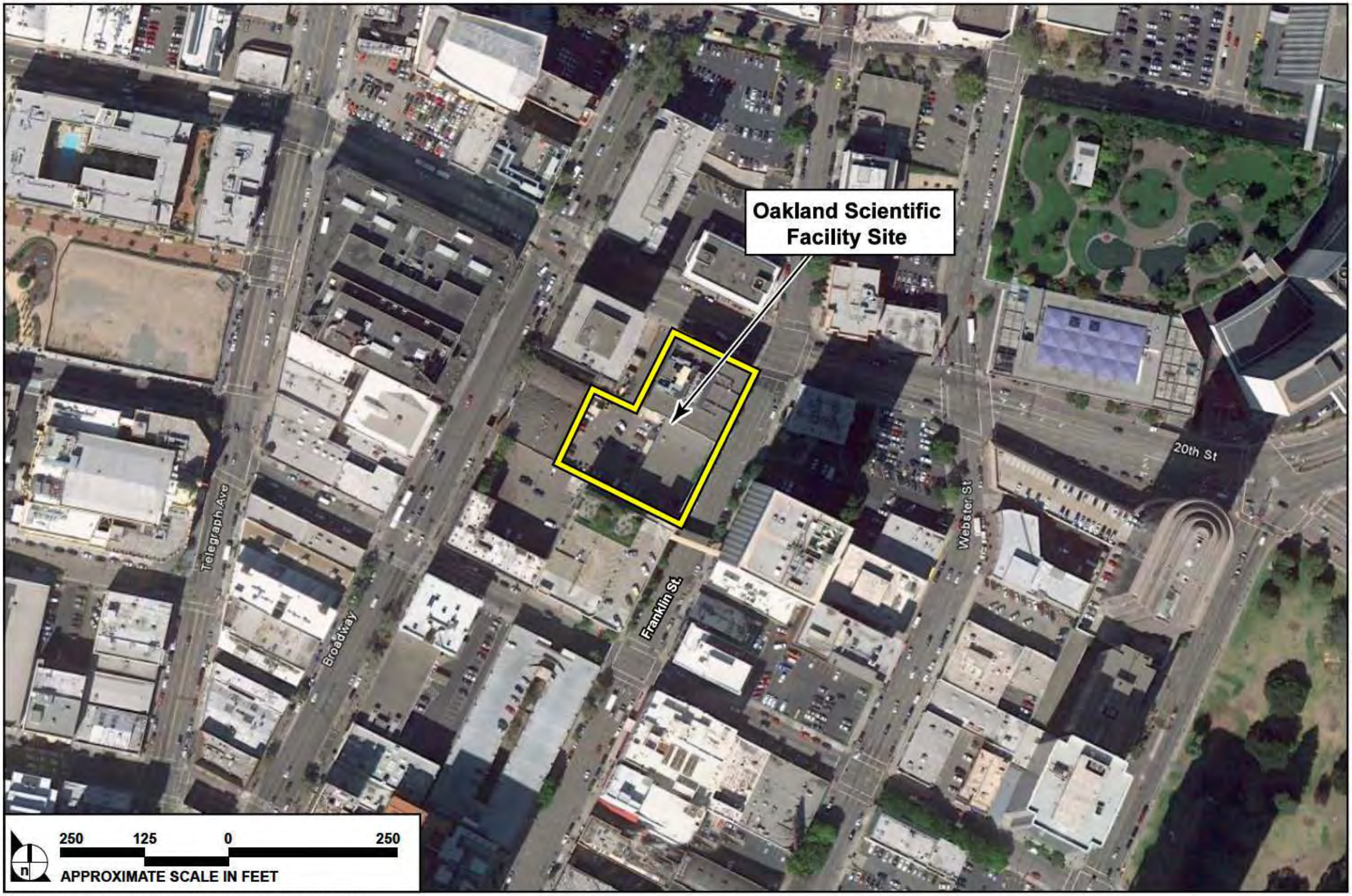
A reduced-size alternative would include the construction of a smaller building at the site of the Proposed Action. Under this alternative, the approximately 3,000 gross-square-meter (32,000-gsf) HPC floor would be constructed. However, there would be only one floor of office space. Therefore, the total size and elevation of the building would be reduced compared to the Proposed Action. The reduced size alternative was eliminated because it would not meet the purpose and need of the Project in that it would reduce the office space by one-half, thereby defeating the objective of consolidating the ASCR funded and related programs and researchers.

3.4 CONTROLS

This section describes the procedures, which would be followed, and the permits and approvals, which would be obtained for the Proposed Action and alternatives.

3.4.1 UC LBNL Standard Operating Procedures, Standard Construction Specifications, and Best Practices

There are standard operating procedures, standard construction specifications, and best practices used by UC LBNL on projects at the LBNL site. The Proposed Action and alternatives would be subject to these procedures and practices. Specific reference to these procedures and practices is made in **Section 5.0** and they are quoted where applicable. These procedures, specifications, and best practices are generally intended to ensure the safety of subcontractors, LBNL visitors and staff, and the public during construction projects, and to reduce the overall impact that construction/demolition actions have at LBNL on the surrounding community, and on the environment.



SOURCE: Google Earth – August 2009, Impact Sciences, Inc. – July 2010

FIGURE 3.0-9

Location of Oakland Scientific Facility

924-006•07/10

3.4.2 Standard Project Features

Standard Project Features (SPFs) were originally identified in the UC LBNL 2006 LRDP EIR[11] as environmentally proactive measures that would be incorporated into all LBNL projects. These measures have been adopted as part of the LBNL 2006 LRDP EIR by The Regents. The SPFs pertinent to the CRT facility are set forth in **Appendix 1**. For clarity, **Appendix 1** lists SPFs as characterized in the 2006 LDRP EIR in Chapter 5, entitled Mitigation Monitoring and Reporting Program. The SPFs described herein are incorporated into and are a part of the project description of the Proposed Action and alternatives.

3.4.3 Plans Applicable to this Project

A variety of plans are applicable to cover the work carried out under the Proposed Action and alternatives. These are referenced in the subsections of **Section 5.0** as appropriate, and are summarized here.

- *Soil Management Plan (SMP)* and *Groundwater Monitoring and Management Plan (GMMP)* must be prepared in accordance with the California Department of Toxic Substances Control -administered Corrective Measures Implementation Workplan. A site-specific SMP is required by the LBNL Capital Project Procedures Manual. This plan describes the requirements for soil and groundwater testing.

- *Asbestos Compliance Work Plan, Lead Compliance Work Plan, and Silica Exposure Controls* must be implemented by the construction contractor to comply with relevant state and federal regulations preventing worker exposure to these materials. The Occupational Safety & Health Administration (OSHA) regulations also include extensive, detailed requirements for worker protection applicable to any activity that could disturb lead- or asbestos-containing materials, including maintenance, renovation, and demolition. For lead, these requirements include respiratory protection, protective clothing, housekeeping, special high-efficiency filtered vacuums, hygiene facilities, medical surveillance, and training.

- *Site-Specific Injury and Illness Prevention Plan* including exposure prevention measures must be implemented by the construction contractor(s).

- *Site-Specific SWPPP* designed to specifically address potential discharges associated with construction must be prepared for the Proposed Action and the alternatives that would disturb more than 1 acre of land. A Notice of Intent must be submitted to the Regional Water Quality Control Board (RWQCB) to comply with the Construction General Permit requirements and conditions.

- *Communications Plan* to ensure that UC LBNL personnel and contractors are informed regarding hazards at the construction site would be developed by the Project Manager. Regular project site evaluations would be performed during project construction by a safety professional and project engineer to monitor the effectiveness of implemented measures.

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11 LBNL 2006 Long Range Development Plan Final Environmental Impact Report (SCH No. 2000102046). July 2007.

- *Self-Assessment Summary Report* and a *Site Environmental Report* are prepared by UC LBNL on an annual basis to aid in compliance with environmental laws and regulations governing hazardous materials, and worker safety, emergency response, and environmental protection.

3.4.4 Environmental Permits and Approvals

The following permits and approvals from regulatory agencies would be obtained for the project.

- LBNL is located on land owned by the University of California. The Regents is the University's decision-making body, including for decisions regarding the California Environmental Quality Act (CEQA). The Regents certified an EIR for and approved the construction and operation of the proposed CRT facility in 2008. However, the Proposed Action and alternatives are subject to and conditioned upon completion of the NEPA process.

- State Water Resources Control Board (SWRCB), NPDES California General Permit for Storm Water Discharges associated with Construction Site Discharges (Construction General Permit). For the Proposed Action and alternatives that would disturb more than 1 acre of land area, UC LBNL will be required to file a Notice of Intent (NOI) and obtain coverage under the Construction General Permit.

- Bay Area Air Quality Management District (BAAQMD) Authority to Construct and Permit to Operate. This would be needed from the BAAQMD for the stationary emission sources (boilers and generators) included in the Proposed Action and alternatives.

4.0 AFFECTED ENVIRONMENT

This section presents the affected environment for the Proposed Action and each of the alternatives that have been selected for detailed evaluation in this Environmental Assessment (EA). As noted in **Section 1.0**, the actions proposed by the U.S. Department of Energy (DOE) are to relocate and consolidate federally funded programs and equipment into building space that can meet the programmatic needs of the National Energy Research Scientific Computing Center (NERSC) and the Computational Research Division (CRD), and co-locate a portion of the joint LBNL/UCB Computational Science and Engineering program (CSE) a related program, with NERSC and CRD. To satisfy the programmatic and space needs, the University of California (UC or the University) would construct a new building, the Computational Research and Theory (CRT) facility, on the Lawrence Berkeley National Laboratory (LBNL) site. The construction of the new building would be a consequence of the DOE's Proposed Action. Therefore, in describing the affected environment for the Proposed Action, this section presents existing conditions at the site of the proposed CRT facility. For ease of reference, the CRT facility site is referred to as the Proposed Action site in this EA.

4.1 ISSUES DETERMINED NOT TO WARRANT FURTHER CONSIDERATION

DOE guidance recommends against addressing clearly insubstantial effects in detail and advocates that the EA provide enough information to show why greater consideration of these insubstantial effects is not needed.[1] The following environmental topics were determined not to warrant further consideration for reasons presented below. In the absence of effects, no cumulative effect is possible and therefore these environmental topics are also not discussed in **Section 6.0, Cumulative Effects,** of this EA.

4.1.1 Land Use and Planning

Under the Proposed Action, the CRT facility would be located in the western portion of the LBNL site. The LBNL site is situated in the eastern hills of the cities of Berkeley and Oakland in Alameda County on approximately 200 acres that are owned by the University. Development on the LBNL site is subject to the principles, strategies, and design guidelines in the LBNL 2006 Long Range Development Plan (LRDP) and any other applicable LBNL policies. The 0.91-hectare (2.25-acre) CRT facility site, which is located within the Berkeley city limit, is undeveloped, although portions of the site have been previously disturbed by a road cut and installation of utilities. The site is flanked by Buildings 70 and 70A to the east, the Building 50 complex to the north, open space to the south, and Cyclotron Road and the Blackberry

1 U.S. Department of Energy (DOE), 2004, Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements, page 3.

Canyon entrance gate to the west. The nearest off-site residential uses (Foothill Student Housing Complex) are located approximately 209 meters (685 feet) southwest of the site on the UC Berkeley campus. There are also multi-family residences and the Tibetan Nyingma Institute located approximately 241 meters (790 feet) south of the project site along Highland Place. The Proposed Action would relocate the Advanced Scientific Computing Research (ASCR)-funded LBNL programs and other related UC Berkeley/LBNL programs into the CRT facility, which would be consistent with the general land uses of LBNL and the applicable policies in the LBNL 2006 LRDP, including policies to cluster similar and related uses near each other. The proposed facility would be constructed by the University and would be exempt from local land use regulations, including general plans and zoning (see Article IX, Section 9 of the California Constitution). As shown by the analysis in other sections of this EA, the Proposed Action would not result in environmental effects that would adversely affect adjacent land uses.

Alternative 1 would result in the development of CRT facility on the Cafeteria Parking Lot site on the LBNL site. Similar to the Proposed Action, this alternative would be consistent and compatible with LBNL policies and plans. As shown by the analysis in other sections of this EA, Alternative 1 would not result in environmental effects that would adversely affect adjacent land uses.

Alternative 2 would be located at the University-owned Richmond Field Station. The alternative site for the CRT facility at UC Berkeley Richmond Field Station (RFS) is an approximately 3.2-acre undeveloped, although disturbed, site that is currently used as a storage area for California Partners for Advanced Transit and Highways research vehicles. The site is in the central portion of RFS and is distant from adjacent land uses. The nearest off site residential development, Marina Bay neighborhood, is located approximately 460 meters (1,500 feet) to the southwest of the alternative site. Land uses associated with Alternative 2 would be compatible with the uses that comprise the RFS, including academic teaching and research. Construction and operation of the facility would be consistent with University policies. As shown by the analysis in other sections of this EA, Alternative 2 would not result in environmental effects that would adversely affect adjacent land uses.

Alternative 3 would be located on the former California Department of Health Services (DHS) site at 2151 Berkeley Way in Berkeley. The site is owned by the University. The portion of the DHS site where the CRT facility would be constructed is occupied by the former DHS building and its parking lot. An apartment complex is located less than 80 meters (263 feet) southeast of the alternative site, on the same city block as the DHS site. Adjacent land uses include other campus facilities as well as non-campus commercial and residential uses. As shown by the analysis in **Section 5.9** of this EA, Alternative 3 would result in construction noise levels that would temporarily exceed acceptable noise levels for adjacent residential land uses. There would be no other effects on adjacent land uses.

Alternative 4 is an existing building located on San Pablo Avenue, between 67th and Folger Streets that would be leased for the CRT facility. The property is made up of parcels that lie within three municipalities (cities of Berkeley, Emeryville, and Oakland). The existing building is surrounded by industrial uses to the north, south, and west. Residential uses are located north and east of the site along San Pablo Avenue and to the south on 67th Street. The use of the existing facility, with some modifications to accommodate the NERSC and add staff offices, would be compatible with surrounding industrial uses. As shown by the analysis in **Section 5.9** of this EA, Alternative 4 would result in construction noise levels that would temporarily exceed acceptable noise levels for adjacent residential land uses. There would be no other effects on adjacent land uses.

Under the No Action alternative, the existing Oakland Scientific Facility (OSF) would continue to be used by NERSC and a new facility would not be constructed. City of Oakland general plan policies would continue to apply to the leased facility. There would be no land use impacts.

4.1.2 Intentional Destructive Acts

In accordance with interim guidance from the Office of NEPA (National Environmental Policy Act) Compliance Policy (part of the DOE Office of General Counsel), the DOE considers intentional destructive acts (i.e., acts of sabotage or terrorism) in all its EAs and environmental impact statements (DOE 2006).

The Proposed Action and Alternative 1 would be located on the LBNL site, which is secured by a fence, and controlled access is available only at three entry gates. Card keys would be used for building access, during both business and non-business hours. The Proposed Action and Alternative 1 would be subject to all LBNL policies and programs related to security and safety. Furthermore, construction and operation activities under the Proposed Action and Alternative 1 would not involve the transportation, storage, or use of radioactive, explosive, or toxic materials, other than diesel fuel stored on site for the emergency generators and batteries to provide backup power to the computers. Given the nature of activities and research to be conducted in the CRT facility, the Proposed Action and Alternative 1 would not offer any particularly attractive targets of opportunity for terrorists or saboteurs to inflict adverse impacts to human life, health, or safety and an intentional destructive act would likely have no significant impact on the human health or the environment. Neither the Proposed Action nor Alternative 1 is expected to require security in addition to that already in place for the LBNL site.

The RFS site where Alternative 2 would be located is surrounded on all sides by chain-link fencing that is at least 6 feet tall. There is one entrance to the site, and access is monitored by a guard booth. There would be controlled entry into and within the building. The security precautions at the RFS site are considered appropriate given the type of work that is proposed for the CRT facility. Given the nature of activities and research to be conducted in the CRT facility, the potential for the alternative to trigger intentional destructive acts is low.

The DHS site, which is the site under Alternative 3, is not a fenced site and there is no dedicated security at this site. Although there would be no security precautions other than controlled entry into and within the building, given the type of activities and research that would be carried out, the potential for the alternative to trigger intentional destructive acts is low.

The leased facility site under Alternative 4 is not a fenced site and there is no dedicated security at this site. Although there would be no security precautions other than controlled entry into and within the building, given the type of activities and research that would be carried out, the potential for the alternative to trigger intentional destructive acts is low.

The OSF under Alternative 5 is not a fenced site, although access to the facility is controlled with controlled entry. Although there are no security precautions other than controlled entry, given the type of work that is carried out at OSF, the potential for the alternative to trigger intentional destructive acts is low.

4.1.3 Aviation Hazards

The Proposed Action and Alternative 1 sites are more than 17.7 kilometers (11 miles) northeast of the Oakland Metropolitan Airport, and are also not located within the vicinity of a private airstrip. Implementation of the Proposed Action or Alternative 1 would pose very little risk to CRT users from aviation hazards.

The RFS site under Alternative 2 is more than 20 kilometers (12.5 miles) north of the Oakland Metropolitan Airport, and is also not located within the vicinity of a private airstrip. Given this, the risk from aviation hazards from implementation of Alternative 2 would be low.

The DHS site under Alternative 3 is more than 15 kilometers (about 10 miles) north of the Oakland Metropolitan Airport, and the site is also not located within the vicinity of a private airstrip. Implementation of Alternative 3 would pose very low risk of aviation hazards to the CRT facility.

The Alternative 4 site is more than 13 kilometers (8 miles) north of the Oakland Metropolitan Airport and the site is also not located within the vicinity of a private airstrip. Implementation of Alternative 4 would pose minimal risk to facility users from aviation hazards.

OSF Alternative 5 is more than 9 kilometers (5.5 miles) from the Oakland Metropolitan Airport and the site is also not located within the vicinity of a private airstrip. Implementation of Alternative 5 would pose minimal risk to facility users from aviation hazards.

4.2 ISSUES DETERMINED TO WARRANT FURTHER CONSIDERATION

4.2.1 Geology and Soils

Proposed Action

Site Geology

The LBNL site is located in the Berkeley Hills region of California's Coast Ranges geomorphic province (LBNL 2010). Bedrock at LBNL consists primarily of Cretaceous and Miocene sedimentary and volcanic units. These units form a northeast-dipping, faulted homocline, which underlies most of the facility, and has been disrupted in places by ancient and modern landslides. From the structurally lowest to structurally highest units, the homocline includes the Great Valley Group, the Orinda Formation, and the Moraga Formation. The Great Valley Group and Orinda Formation consist of mudstones and fine- to medium-grained sandstones at the LBNL site. The Moraga Formation is a resistant ridge-forming unit that is composed primarily of andesitic volcanic rocks. **Figure 4.0-1, Bedrock Geologic Map of LBNL** shows the bedrock geology of the LBNL site based on data from surface outcrops, construction excavations, trenches, and numerous borings. **Figure 4.0-2, Geologic Cross Section Through the LBNL Site,** is a geologic cross section through the LBNL site (LBNL 2010). As shown on **Figure 4.0-1**, the project site is underlain by the Great Valley Group (LBNL 2010). The LBNL site is located in an area where no significant mineral or aggregate deposits are present (LBNL 2007).

Seismicity and Faults

The Proposed Action site is located approximately 122 meters (400 feet) east of the eastern trace of the Hayward fault, one of several major active fault zones in the San Francisco Bay Area. The site is located within the Earthquake Fault Zone defined for the Hayward fault by the State of California pursuant to the Alquist-Priolo Earthquake Fault Zoning Act. However, a fault investigation did not identify any active fault traces at the CRT building site (Kleinfelder 2009).

The most recent major earthquake on the Hayward fault occurred in 1868 (on the southern portion of the fault, near Mills College). The United States Geological Survey (USGS) Working Group on California Earthquake Probabilities estimates that there is a 27 percent chance that the Hayward–Rodgers Creek

Fault System[2] will experience an earthquake of magnitude 6.7 or greater by 2032 (USGS 2003). A major earthquake on the Hayward fault is anticipated to produce violent to very violent ground shaking at the LBNL site (LBNL 2008).

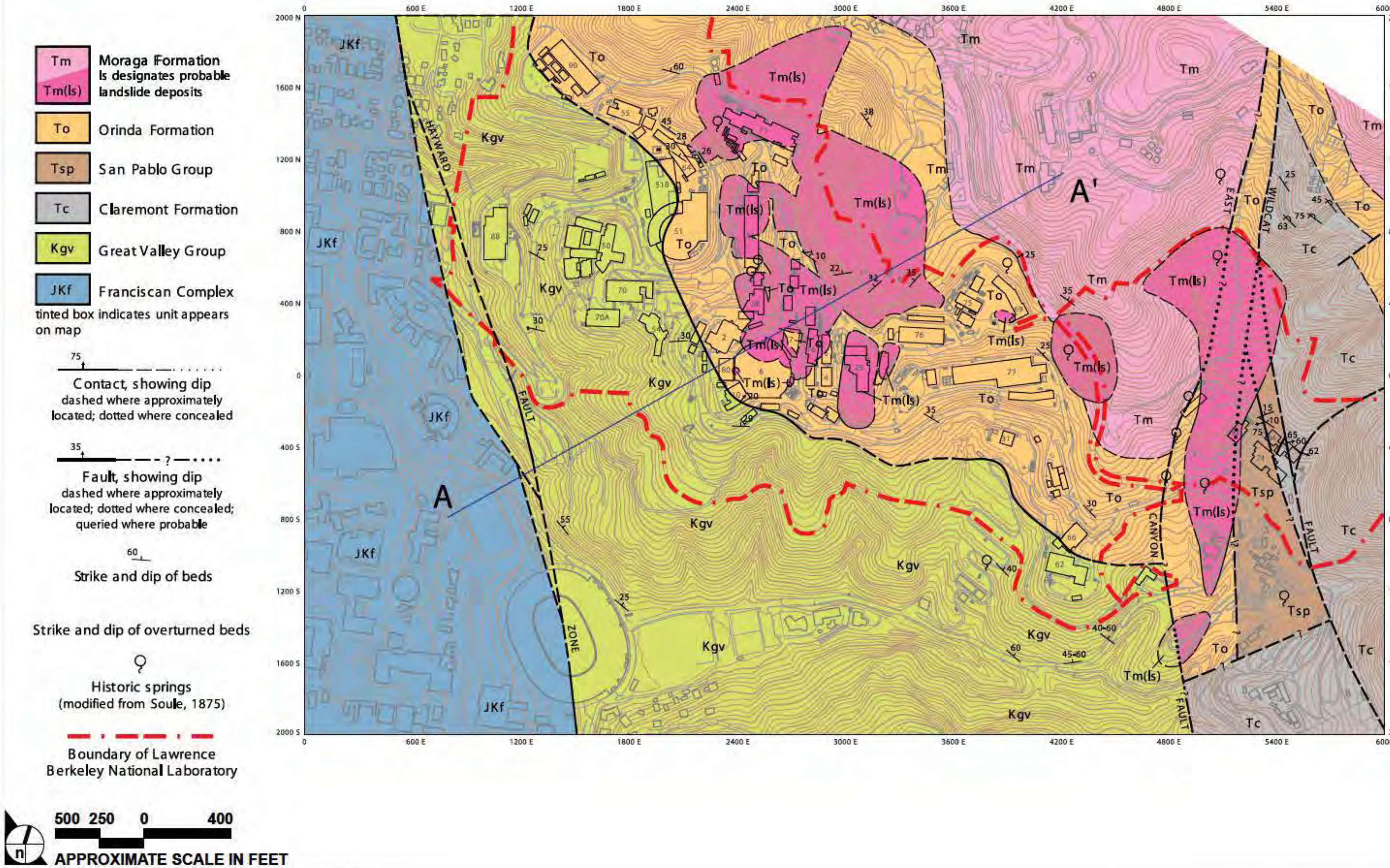
Additionally, the San Andreas Fault parallels the Hayward fault approximately 27 kilometers (17 miles) west of the LBNL site, and the Great Valley–Concord–Calaveras fault zone is located about 21 kilometers (13 miles) to the east. Taken together, along with other faults in the area, there is a 62 percent probability of at least one magnitude 6.7 or greater earthquake striking the San Francisco Bay Area (Bay Area) before 2032 (USGS 2003). The intensity of ground shaking at the LBNL site would be reduced as the distance from the epicenter of the earthquake increases; however, a major earthquake on any of the active Bay Area faults could still produce violent shaking at the LBNL site (LBNL 2008).

Seismically Induced Landslides and Other Landslides

Earthquake shaking can trigger slope failures in steep hillside areas, particularly those already prone to failure. Seismic hazards mapping issued by the State of California pursuant to the Seismic Hazards Mapping Act shows much of the Berkeley hills rangefront, including portions of the UC Berkeley campus and the LBNL site, as within the zone of seismically induced landslide hazard (California Geological Survey [CGS] 2003). The seismically induced landslide hazard zone includes the locations of existing landslides and areas where geological and geotechnical data and analyses indicate that slopes may be susceptible to earthquake-induced failure.

Some unstable slopes on the LBNL site have experienced ground failure. To address the risk of future landsliding, UC LBNL completed a detailed mapping program to locate slide-prone areas (LBNL 2008). Based on the mapping, UC LBNL has implemented an ongoing program to mitigate the risk of future landsliding. The program includes installation of hydraugers (horizontal drains), vertical wells, and subdrains to maintain low groundwater levels, and construction of retaining walls in slide-prone areas. An array of hydraugers is present between Cyclotron Road and the southern portion of the Building 50 complex in the site vicinity. These drains were installed in the late 1980s and serve to drain groundwater from the slope to help limit the potential for landslide movement (LBNL 2008).

2 The Rodgers Creek fault, located north of San Pablo Bay, is widely considered to be the northward extension of the Hayward fault, and the two faults are often discussed as a single combined system.

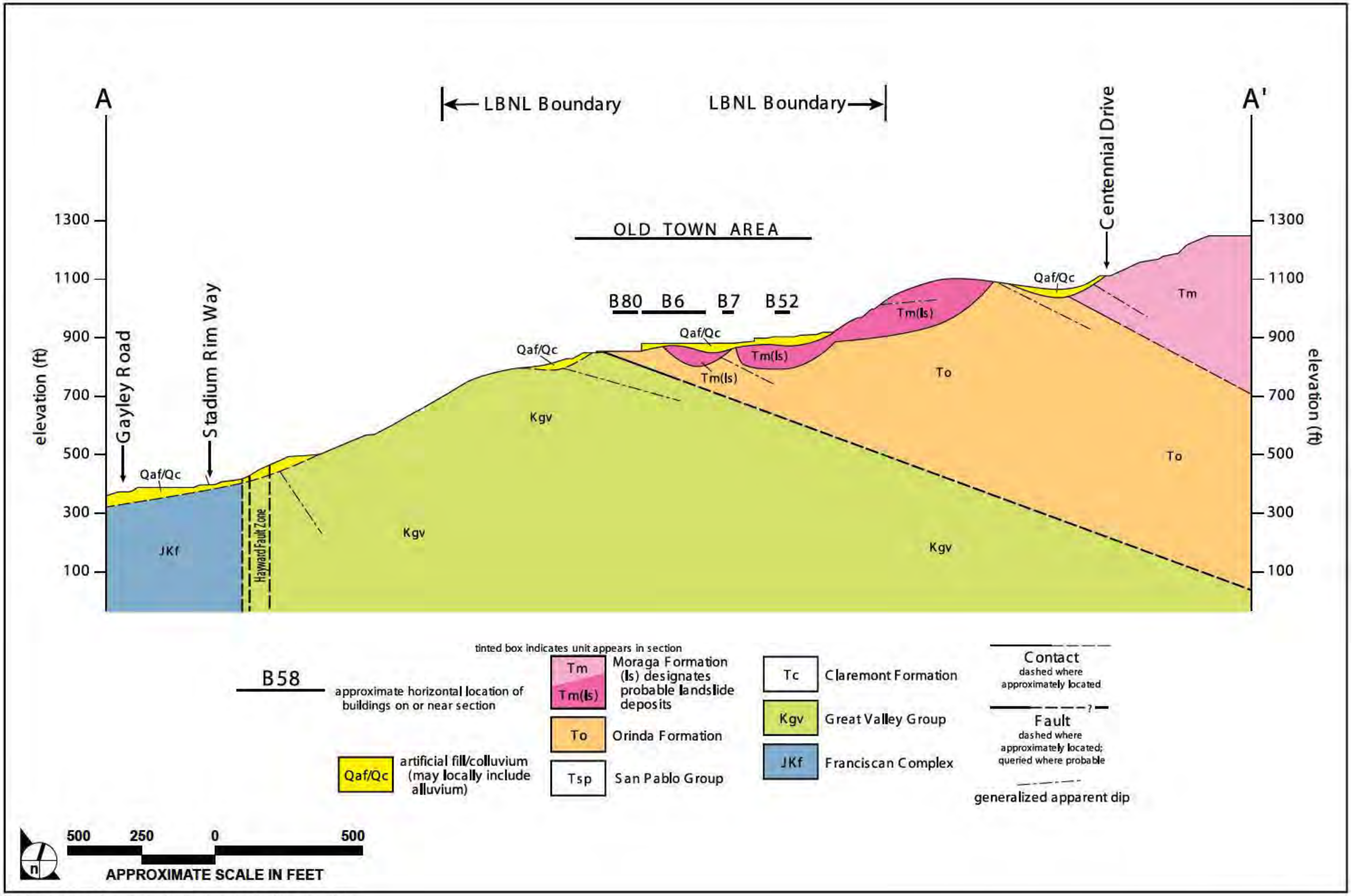


SOURCE: Parsons Engineering Science, Inc, and UC LBNL – June 2010

FIGURE **4.0-1**

Bedrock Geologic Map of LBNL

924-006•07/10



SOURCE: Parsons Engineering Science, Inc, and UC LBNL – June 2010

FIGURE **4.0-2**

Geologic Cross Section Through the LBNL Site

924-006•09/10

The project site includes two areas designated as "medium risk" for landsliding on the LBNL slope stability evaluation map, and trenches excavated as part of the fault-trace investigation identified evidence of a dormant landslide at the project site (Kleinfelder 2009). A portion of the site is underlain by a small landslide repair performed in the 1970s. A seismic slope stability investigation conducted at the project site in accordance with CGS Special Publication 117 (Guidelines for Evaluating and Mitigating Seismic Hazards) confirmed there is a low probability of earthquake-induced landslide at the project site (Kleinfelder 2010).

Other Geologic Hazards

Other geologic hazards such as tsunami, seiche,[3] liquefaction, and settlement are unlikely to affect the Proposed Action site. Tsunamis and seiches would not affect the site because of the elevation of the site and the distance from San Francisco Bay and other enclosed water bodies. The LBNL site is not within a Seismic Hazard Zone defined by the State of California pursuant to the Seismic Hazards Mapping Act (CGS 2003), but localized liquefaction hazards may be present at the LBNL site in areas underlain by shallow groundwater and poorly engineered fill or alluvial materials. This is not the situation at the Proposed Action site, where relatively thin soils overlie shallow bedrock; liquefaction risk at the site is accordingly considered low. The risk of seismically induced settlement is also considered low due to the relatively thin soils and shallow depth to bedrock at the site (LBNL 2008).

Soils and Mineral Resources

The CRT facility site lies almost entirely in an area of Maymen loam soils, although the easternmost portion overlies soils assigned to the Xerorthents-Millsholm complex. Both are relatively thin soils (less than 2 feet thick) on bedrock, and are well drained with rapid runoff and high erosion potential due to steep slopes. Both soil types have low shrink-swell potential. Soils in the eastern portion of the project area have likely been highly disturbed due to past grading and construction of Buildings 50, 50A, 50B, 70, and 70A and associated parking areas and roads (LBNL 2008).

Alternative 1, Cafeteria Parking Lot Site

Please refer to the conditions of the LBNL site described above under Proposed Action. The Cafeteria parking lot site is similar to the Proposed Action site in terms of risk from seismic ground shaking and differential settlement. However, the site is not within an area that has the potential for earthquake-induced landslides. In addition, unlike the Proposed Action, the Alternative 1 site is not

3 A seiche is a standing wave in an enclosed or partially enclosed body of water. Seiches can occur in response to earthquake shaking.

located within the state-defined Earthquake Fault Zone for the Hayward fault. As identified above, the LBNL site is located in an area where no significant mineral or aggregate deposits are present (LBNL 2007).

Alternative 2, RFS Site

The RFS site is located 3.5 kilometers (2.2 miles) from the Hayward fault and within 1.6 kilometers (1 mile) of San Francisco Bay. The alternative site is located in a topographically flat area, and a portion of the site has been excavated and backfilled with imported soil. The site is underlain by Holocene (Recent) alluvium (UC Berkeley 2008). Based on soil boring data, the University concluded that the liquefaction potential for the upland area of the RFS is not high (UC Berkeley 2003). In addition, based on maps prepared by the Association of Bay Area Governments (ABAG), the site is located in an area that has a moderate to very low susceptibility for liquefaction due to water saturation (ABAG 2009). The alternate site is not located in an area of landslide risk. The RFS is located in an area where no significant mineral or aggregate deposits are present.

Alternative 3, Former DHS Site

The Hayward fault runs through the eastern portion of the UC Berkeley campus. The former DHS site is located west of the Campus Park, roughly 1 kilometer (0.6 mile) from the Hayward fault and outside the state-defined Earthquake Fault Zone for the Hayward fault. Therefore, the site is similar to the Proposed Action site in terms of risk of substantial seismic ground shaking. The blocks adjacent to the campus, including the DHS site, are not located in a liquefaction hazard zone (UC Berkeley 2009). The DHS site is not located in an area of landslide risk. The DHS site is located in an area where no significant mineral or aggregate deposits are present.

Alternative 4, Leased Facility on San Pablo Avenue

This alternative would use an existing building on San Pablo Avenue in Berkeley, approximately 3.9 kilometers (2.4 miles) west of the Hayward fault, and 27 kilometers (17 miles) east of the San Andreas Fault (USGS 2006). The building was constructed in 1956, and was constructed in accordance with the then-current edition of the Uniform Building Code. The site is located in an area that is moderately susceptible to liquefaction due to water saturation (ABAG 2009), and has, per the ABAG maps, a low potential for seismically induced liquefaction (ABAG 2001). The alternative is not located in an area of landslide risk (CGS 2003). The leased facility is located in an area where no significant mineral or aggregate deposits are present.

Alternative 5, No Action

The existing Oakland Scientific Facility (OSF) building was constructed in 1964 in accordance with the Uniform Building Code and City of Oakland Building Code. The building was renovated in 1999 to meet NERSC's needs. The building is not located in an area at risk of damage from liquefaction, ground settlement, fault rupture, or landslides. The site would be subject to substantial ground shaking in the event of a major earthquake on any of the faults in the Bay Area. The site is not located in an area where mineral or aggregate deposits are present.

4.2.2 Water Resources

Proposed Action

Drainage and Surface Water Quality

The Proposed Action is located in the Blackberry Canyon area. Storm water from the Proposed Action site flows into an unnamed drainage locally known to the LBNL community as Cafeteria Creek. Cafeteria Creek drains to a culvert just downstream of the CRT facility site (near the LBNL Blackberry Canyon Gate), which eventually drains to Strawberry Creek on the UC Berkeley campus.

All development at the LBNL site is subject to best management practices (BMPs) as detailed in the LBNL Storm Water Pollution Prevention Plan (SWPPP) to control the quality and quantity of storm water runoff. Steeply sloping open space areas on the site have the potential to contribute sediment (turbidity) to receiving waters, although there is no outward indication of instability on the vegetated slopes of the project site.

To avoid adverse impacts on surface water quality, UC LBNL uses only one type of herbicide, which is applied locally (no broadcast spraying) to prevent re-sprouting of cut eucalyptus trunks. Pesticide use is restricted to non-flying insects within buildings (no spraying), and rodents are controlled by non-pesticide methods (trapping). Only licensed contractors are hired to administer pesticides and herbicides in compliance with all applicable regulations. The UC LBNL Environmental Health and Safety Division (EH&S) reviews these practices annually (LBNL 2008).

Flooding

The LBNL site is not within a 100-year flood zone as mapped by the Federal Emergency Management Agency (FEMA).

Groundwater and Groundwater Quality

Groundwater depths at the LBNL site vary from at the ground surface (where springs occur) to approximately 30 meters (100 feet) below ground surface (bgs). At the Proposed Action site, depth to groundwater is estimated to be approximately 15 meters (50 feet) bgs, with a westerly flow direction. The groundwater at LBNL is not used for domestic, irrigation, or industrial purposes; potable water is supplied by the East Bay Municipal Utility District (EBMUD). There is no known groundwater contamination at the Proposed Action site. Information related to groundwater contamination is discussed in **subsection 4.2.3** below**.** Groundwater in the vicinity of the LBNL site is not used as a source of potable water.

Alternative 1, Cafeteria Parking Lot Site

Please refer to the conditions of the LBNL site under the Proposed Action. Storm water runoff from the Cafeteria parking lot currently drains to Cafeteria Creek. There is no known groundwater contamination at this site (LBNL 2008). Similar to the Proposed Action, this site is not within a 100-year flood zone or in an area at risk for inundation due to sea level rise in the next century.

Alternative 2, RFS Site

The RFS is located in a small-unnamed watershed that primarily drains the neighboring City of Richmond properties to the west and north. The watershed is almost completely urbanized and consists of housing, light industry, commercial and institutional facilities, and some small parks. On-site stormwater drainage is by overland flow that is conveyed from the upland area through a series of culverts and open swales. Two subcatchments on the RFS drain to two storm drain outlets at the edge of Western Stege Marsh, known as the Eastern Storm Drain and the Western Storm Drain. These storm drains discharge into a series of tidal salt marsh channels that drain to Meeker Slough (UC Berkeley 2008).

According to the Current Conditions Report prepared for the RFS site, at least three water-bearing zones are present at the RFS: a shallow groundwater zone, from approximately 3 to 6 meters (10 to 20 feet) bgs, an intermediate groundwater zone, from approximately 9 to 23 meters (30 to 74 feet) bgs, and a deeper-groundwater zone, from approximately 27 to 30 meters (90 to 100 feet) bgs. Based on groundwater monitoring well observations, groundwater flow is generally south toward San Francisco Bay (UC Berkeley 2008). Groundwater contamination is discussed in **subsection 4.2.3** below.

According to the sea level rise map prepared by the San Francisco Bay Conservation and Development Commission (BCDC*)*, the Alternative 2 site is not at risk of inundation from sea level rise expected in the next century (BCDC 2008b).

Alternative 3, Former DHS Site

All overland flow in the area of the DHS site is collected by curb-and-gutter systems and delivered through side inlets to the storm drainage culverts beneath local streets. The culverts drain into lower Strawberry Creek at locations west of the Campus Park. Storm water generated at the DHS site is subject to the UC Berkeley storm water management plan. The DHS site is not within a 100-year flood zone (UC Berkeley 2009). The site is not located in an area at risk for inundation due to sea level rise in the next century (BCDC 2008a).

Alternative 4, Leased Facility on San Pablo Avenue

The alternative would use an existing building at 6701 San Pablo Avenue, Berkeley. The alternative site is completely developed with impervious surfaces. According to the sea level rise map prepared by the BCDC, the Alternative 4 site is not at risk of inundation from sea level rise expected in the next century (BCDC 2008a). The alternative site is outside the FEMA 100-year flood zone (ABAG 2010).

Alternative 5, No Action

The alternative would continue to lease the OSF site in the City of Oakland. The site is not within a 100-year flood zone or an area that would be affected by sea level rise.

4.2.3 Hazards, Human Health, and Accidents

Proposed Action

Hazardous Materials

Hazardous materials are grouped into the following four categories, based on their properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), and reactive (causes explosions or generates toxic gases). Some hazardous materials are used in facility operations and maintenance, while others are used for research. UC LBNL complies with applicable federal, state, and local laws and regulations for the handling, storage, and disposal of hazardous materials and wastes to minimize worker exposure and environmental impact. Compliance with these requirements also minimizes the potential for release of hazardous materials to the environment in the event of a fire or earthquake. There is no history of hazardous materials use, storage, or disposal on the Proposed Action site (LBNL 2008).

Soil and Groundwater Contamination

In 1991, LBNL began a rigorous evaluation of potential historical releases of contaminants to the environment as part of an investigation under RCRA, which was required by its Part B hazardous waste facility permit. This process revealed contamination in soil and groundwater due to past site activities.

The chemicals of concern detected in the soil and groundwater consisted of chlorinated volatile organic compounds (VOCs), mostly degreasing solvents used to clean equipment and their degradation products. Other detected chemicals included polychlorinated biphenyls (PCBs), petroleum hydrocarbons, semi-volatile organic compounds (SVOCs), and metals. All identified areas of soil contamination were cleaned up to levels consistent with LBNL operations (designated as institutional land use) and acceptable to regulatory oversight agencies (LBNL 2007). LBNL has a groundwater monitoring and cleanup program in place to remediate VOC-contaminated groundwater and prevent its migration off site (LBNL 2008). This program is being conducted under the regulatory oversight of the California Environmental Protection Agency DTSC. The radionuclide tritium was also detected in the groundwater at the LBNL site. The cleanup of the tritium-contaminated groundwater is overseen by the DOE.

The Proposed Action site does not overlie an area of groundwater contamination, and there are no known areas of soil contamination underlying the site. The nearest area of contaminated groundwater is approximately 0.3 kilometer (0.2 mile) northeast of the site, near Building 51.

Fire Hazards

The northern and eastern boundary of the LBNL site is located along a portion of the interface between wildlands and developed lands in the East Bay hills. Under LBNL's vegetation management program, vegetation is treated annually on the LBNL site such that ground fuels cannot produce flame heights in excess of 1 meter (3 feet), and ground plantings within 3 meters (10 feet) of buildings and roadways produce even lower flame heights; trees are "limbed up" so that flammable branches are at least 2.5 to 3 meters (8 to 10 feet) above the ground, and bushes that would allow ground-based fires to rise into tree canopies are removed (LBNL 2008). Buildings on the LBNL site are constructed and designed to conform with requirements for fire resistive construction defined by the California Building Code and fire code safety requirements.

The LBNL site is provided firefighting services by the Alameda County Fire Department, which staffs a fire station (Station 19) on the LBNL site. This fire station and associated Alameda County Fire

Department services are fully paid for by LBNL funds. The Alameda County Fire Department has mutual aid agreements with other agencies, including the cities of Berkeley and Oakland and the East Bay Regional Park District, which can be activated in the event of a major emergency (LBNL 2008).

The Proposed Action site is located in a stand of predominantly eucalyptus trees and a grassland understory. Areas adjacent to the site have similar vegetation communities. The Proposed Action site is within 0.5 kilometer (0.3 mile) of Station 19.

LBNL Emergency Response Plan

UC LBNL has developed a Master Emergency Program Plan (MEPP) that establishes policies, procedures, and an organizational structure for responding to and recovering from a major disaster at the LBNL site. The MEPP utilizes the National Incident Management System, which is a nationwide standardized approach to incident management prescribed by Homeland Security Presidential Directive 5 and the Standardized Emergency Management System for managing response to multi-agency and multi-jurisdiction emergencies in California. The MEPP includes a hazard analysis and assessment, which finds that the primary hazards for the LBNL site are a major earthquake along the Hayward fault and a major urban-wildland fire. In view of these primary hazards, the plan includes four phases of emergency management, including mitigation, preparedness, response, and recovery. Mitigation includes activities that eliminate or reduce the occurrence or effects of a disaster.

The MEPP also includes a Wildland Fire Evacuation/Relocation Plan. This plan presents the steps that UC LBNL will implement in the event that any portion of the site is threatened by a major fire. In such an emergency, UC LBNL will order an evacuation of the site either by vehicle or foot, order relocation of employees from one area to another, more protected area, or provide instructions to employees to remain in place and await further instructions. The plan outlines the steps involved in a vehicular evacuation, which include traffic control and use of those gates, and routes that are not threatened by fire. For evacuation by foot, the plan identifies all evacuation routes including the use of the Blackberry Canyon gate near the CRT facility site, and an assembly area on the UC Berkeley campus from where the evacuated employees would be transported by bus to a Bay Area Rapid Transit (BART) station (LBNL 2008).

Alternative 1, Cafeteria Parking Lot Site

The alternative would involve the same hazards as those described above for the Proposed Action. There is no known contamination at the site.

Alternative 2, RFS Site

The southeast portion of the RFS site was used for explosive manufacturing from 1840s until 1945. Soils and sediments at the RFS site contain levels of metals, PCBs, and pesticides above the California hazardous waste Total Threshold Limit Concentration criteria. Most of the contamination within the alternative site at RFS has been remediated (UC Berkeley 2008). However, the University is currently conducting an investigation of pyrite cinders contamination at the site and plans to remediate the site in compliance with DTSC requirements.[4]

The Current Conditions Report provides an evaluation of the groundwater contaminants present at the RFS site. Contamination, including metals, VOCs, and PCBs, has been identified within the shallow-zone groundwater, and fewer contaminants are identified in lower zones (UC Berkeley 2008).

The fire hazard at the alternative site is typical of all urban areas. The site does not have a high potential for wildland fires because the surrounding area does not contain conditions that could result in wildland fires.

Alternative 3, Former DHS Site

The former DHS building contained some contamination associated with its former use, some of which was removed prior to demolition and the remaining in conjunction with the demolition of the building. The UC Berkeley Office of Environment, Health, and Safety (EH&S) has primary responsibility for coordinating the management of hazardous materials on campus in compliance with applicable laws, regulations, and standards. The EH&S Emergency Response Team (ERT), staffed by health and safety professionals, hazardous materials technicians, and licensed hazardous materials drivers, responds to most hazardous materials incidents reported on campus. Currently, the ERT is able to respond to an incident within 15 minutes. In the infrequent cases when outside assistance is required, the ERT may request assistance from other nearby agencies, including the Berkeley Fire Department (BFD) and Alameda County Fire Department (ACFD), or from emergency response contractors (UC Berkeley 2009).

Alternative 4, Leased Facility on San Pablo Avenue

The existing building on San Pablo Avenue that would be leased was constructed in 1956 and was formerly occupied by the Smith-Corona Marchant Corporation (SCM) Data Processing Division. SCM activities at the site included manufacturing of calculating machines, storage and drayage businesses, metal fabrication operations, a neon sign factory, and a storage yard for painting contractors. DTSC has

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4 Communications between Impact Sciences and Karl Hans, UC Berkeley, Environmental Health and Safety.

approved a Removal Action Workplan to remove potential volatile organic compounds and solvent contaminants detected in the groundwater at the site (DTSC 2010). The University currently holds a long-term lease on a portion of the warehouse. The leased facility site is served by the BFD. The site does not have a high potential for wildland fires because the surrounding area does not contain conditions that could result in wildland fires.

Alternative 5, No Action

The alternative involves continued leasing of the existing OSF in Oakland. The site is served by the Oakland fire department and is not at risk from wildland fires.

4.2.4 Biological Resources

Proposed Action

The LBNL site is characterized by clusters of development interspersed with open space that contains a mosaic of vegetation types and wildlife habitats, including oaks and mixed hardwood forests, native and non-native grasslands, chaparral, coast scrub, marsh and wetland communities, and riparian scrubs and forests.

The Proposed Action site is located on a hillside vegetated with approximately 75 trees, primarily eucalyptus, and an understory of annual grassland. Eucalyptus trees may provide roosting and nursery sites for several bat species, including fringed myotis (*Myotis thysanodes*), long-eared myotis (*Myotis evotis*) and pallid bat (*Antrozous pallidus*). The fringed myotis and long-eared myotis are species designated as "Special Animals" by the state. The pallid bat is listed on the California Species of Special Concern. Portions of the site have been previously disturbed in conjunction with the construction of the nearby buildings. There are no creeks, seeps, wetlands or other site features potentially subject to United States Army Corps of Engineers (USACE) and/or California Department of Fish and Game (CDFG) jurisdiction at the CRT facility site (LBNL 2008). The facility site's closest point is approximately 9 meters (30 feet) from the 50-foot buffer of the Cafeteria Creek riparian corridor.

The Proposed Action site is not within or contiguous to any US Fish and Wildlife Service (USFWS) designated Critical Habitat for the Alameda whipsnake (*Masticophis lateralis euryxanthus*, a species listed as threatened both at the state and federal levels). Numerous biological surveys have been conducted of the Proposed Action site and its surroundings, including a June 28, 2007, site-specific suitability analysis of the Proposed Action site for Alameda whipsnake. In the latter analysis, the Proposed Action site was found to be nearby to areas containing high-quality Alameda whipsnake habitat. Specifically, coastal scrub vegetation and open space grasslands occur along south-facing slopes to the south of the project site. While core habitat does not occur within the project boundary and Alameda whipsnake is not expected to permanently reside there, and while the species has never been observed on or adjacent to the Proposed Action site, it is possible that the species may temporarily occur on or nearby to the Proposed Action site (LBNL 2008).

LBNL has developed several SPFs for preventing the incidental taking of the Alameda whipsnake during construction and similar activities at the LBNL site. These SPFs were developed over a period of years and are based on site visits and informal consultation with the USFWS along with the assistance of biologists specializing in the Alameda whipsnake species. These are LBNL SPFs BIO-5(a) through BIO-5(f).

Alternative 1, Cafeteria Parking Lot Site

Please refer to the biological setting for the LBNL site, as described above under the Proposed Action. The Alternative 1 site is almost entirely paved and some of the site is landscaped with trees. The trees on the site include 19 pine trees (*Pinus* sp.), five willow trees (*Salix* sp.), and five other trees.

Alternative 2, RFS Site

The alternative site is disturbed and a portion of it is developed with Building 167 and a parking lot. The habitat on the alternative site is composed of disturbed native and non-native grassland, ornamental trees, eucalyptus trees, and a drainage ditch that is potentially a jurisdictional feature. The grassland at the site provides potential habitat for western burrowing owl (*Athene cunicularia hypugaea*, a state species of concern) and foraging habitat for loggerhead shrike (*Lanius ludovicianus*, a state species of special concern). The eucalyptus grove provides nesting habitat for white tailed kite (*Elanus leucurus*, a state species of concern, fully protected) (UC Berkeley 2003). Native grasslands that occur at the site include California Oatgrass Bunchgrass Grassland (*Danthonia californica*) and purple needlegrass (*Nassella pulchra*). Both grassland types are considered a sensitive natural community by the CDFG "List of California Terrestrial Communities Recognized by the California Natural Diversity Database" (UC Berkeley 2003). No federally listed plant or wildlife species occur on the site.

Alternative 3, Former DHS Site

The alternative site consists of a developed parcel and is in an urban setting that does not support any natural habitat.

Alternative 4, Leased Facility on San Pablo Avenue

The alternative site consists of a developed parcel and is in an urban setting that does not support any natural habitat.

Alternative 5, No Action

The existing facility in Oakland is in an existing building in an urban area that does not support any natural habitat.

4.2.5 Cultural Resources

Proposed Action

Field surveys and archival research at the California Historical Resources Information System's Northwest Information Center have been undertaken to determine whether any archaeological resources have been discovered on the LBNL site. The Northwest Information Center has indicated there is a "low potential for Native American sites in the project area" and thus "a low possibility of identifying Native American or historic-period archaeological deposits in the project area." Additionally, field studies conducted at various times on the LBNL site have not encountered any archaeological resources. Native American archaeological sites in this portion of Alameda County tend to be situated on terraces along ridgetops, midslope terraces, alluvial flats, near ecotones, and near sources of water, including springs. The LBNL site is situated on a steep slope adjacent to Strawberry Creek. Therefore, there is a low-to-moderate potential for Native American sites to be present on the project site (LBNL 2008). In March of 2010, archaeologists from Condor Country Consulting inspected and surveyed the study area to assess the potential for any intact archaeological sites to be present within the project area. No archaeological or historic resources were encountered other than one isolated fragment of obsidian found in a highly disturbed context on the side of a steep slope. It is probable that this is an imported item and/or deposited from the construction of Building 70A that is located upslope (Condor Country Consulting 2010).

The project site does not include any existing buildings or structures other than the Building 50 stairway. The stairway is not currently listed on the National Register of Historic Places (National Register) or the California Register of Historical Resources (State Register). The wooden stairway structure was built in the last 50 years and has been altered many times. The staircase is not exceptional in its appearance. Therefore, it is unlikely to be found eligible for the National or State Register (LBNL 2008). Other LBNL buildings located adjacent to the Proposed Action site include Buildings 50, Buildings 65, 65A and 65B, Building 70 and 70A and Building 88. None of these buildings is recorded as archaeological sites/historic resources. Building 50 was previously evaluated and it was determined that it was not eligible for inclusion in the National Register. Buildings 65A and B are not eligible for inclusion in the National Register because they were built in 1984 and 1983 and are not over 45 years old and therefore are not eligible. Building 65 was built in 1952. Building 65 is an administrative building and has no association with any events or the lives of persons of significance in the history of this area. In addition, none of the architectural and engineering elements of these buildings embody unique or significant design characteristics. Although Buildings 70 and 70A have some associations with Nobel laureates and other prominent Laboratory scientists and researchers, much of their hands-on scientific work occurred in other research facilities. Building 88, constructed between 1958 and 1962, may be eligible for inclusion in the National Register under Criterion A and Criteria Consideration G.

Alternative 1, Cafeteria Parking Lot Site

Please refer to Proposed Action for a description of archaeological resources on the LBNL site. This alternative site is extensively disturbed by the construction of the parking lot and adjacent buildings. There are no structures on the Cafeteria parking lot that would be removed or altered by this alternative.

Alternative 2, RFS Site

This alternative site is in an area that has previously been disturbed. Building 167, which is present on the alternative site, is less than 50 years old and is therefore unlikely to be considered a historic resource. Furthermore, the construction of CRT facility would not require the removal of or alterations to Building 167. Based on a records search conducted by the Northwest Information Center (NWIC) of the California Historic Resources Information System (CHRIS), NWIC concluded that although there are no known pre-historic or historic resources present on the alternative site, due to its location near the bay shore, there is a moderate to high potential of encountering unrecorded prehistoric archaeological resources and a moderate potential of encountering historic-period archaeological resources in the proposed CRT site at RFS (**Appendix 2**).

Alternative 3, Former DHS Site

The building on the former DHS site was not listed as a historic resource either locally or at the state or federal level. There are no archaeological resources known to exist in the vicinity of the former DHS site (UC Berkeley 2009).

Alternative 4, Leased Facility on San Pablo Avenue

The leased facility site on San Pablo Avenue is developed with a warehouse type building constructed in 1956 by the Marchant Calculator Company and parking spaces. According to a records search conducted at the NWIC and consultation with NWIC staff, an architectural evaluation of the Marchant Building located on the project site was conducted in 2006, which concluded that the building was potentially eligible for the National Register of Historic Places. The building has not been recorded with the State Office of Historic Preservation at this time (**Appendix 2**). The alternative would involve alterations to a potential historic resource. There are no archaeological resources known to exist on the site.

Alternative 5, No Action

Under the No Action alternative, the existing LBNL facility in Oakland would continue to be leased and a new building would not be constructed.

4.2.6 Visual Resources

Proposed Action

The LBNL site is located on the steeply sloping hillsides of the Berkeley-Oakland hills, rising from an elevation of about 152 meters (500 feet) near the Blackberry Canyon Gate entrance to about 305 meters (1,000 feet) at the northern border of the site. The hills provide a semi-natural, vegetated open space backdrop to the LBNL facilities. The entire LBNL site cannot be viewed from any single off-site vantage point. However, portions of the LBNL site are visible from residential neighborhoods, public roadways, and public vantage points in the areas that adjoin LBNL. Views of individual buildings or groups of buildings are available from public vantage points such as Memorial Stadium, the Lawrence Hall of Science, and Grizzly Peak Road, and from nearby elevated off-site locations. The visual character of the LBNL's built environment is eclectic. Many buildings display an industrial look and utilitarian quality (LBNL 2008).

The CRT facility site is located on the hillside slope immediately north of the Blackberry Canyon Gate. The project site is currently occupied by a grove of predominantly eucalyptus trees. Partial views of the site are available from portions of the UC Berkeley campus and the City of Berkeley to the south and southeast. These views of the site are partially or fully screened by the trees on and to the south of the site. Views of the site from other directions are obstructed by topography, other buildings, and tree cover.

Alternative 1, Cafeteria Parking Lot Site

The Alternative 1 site is located to the east and upslope from the Proposed Action site. Views of this site from all locations off the LBNL site are obstructed by Building 54 to the south, Buildings 2 and 70 to the west, and by trees and intervening topography to the north and east of the parking lot.

Alternative 2, RFS Site

Views of the RFS site are primarily available from two public viewpoints: the Bay Trail along the southern end of the RFS and the Marina Bay Residential Housing complex southwest of the property (UC Berkeley 2003). Because the alternative site is located in the center of RFS and there are intervening buildings between the viewers and the alternative site, direct views of the alternative site are not available from the Marina Bay viewpoint. Although the site is visible from points along the Bay Trail, it is partially screened by existing buildings.

Alternative 3, Former DHS Site

The area surrounding the alternative site consists of a grid of city blocks developed with a dense but almost entirely low-rise mix of residential, commercial, and institutional buildings. One- to four-story buildings with street level shops and services and office or residences on upper floors predominate along arterials, while interior blocks tend to be exclusively residential. Because it is closer to downtown Berkeley, the immediate vicinity of the alternative has slightly taller buildings. The structures at the DHS site that have been demolished included a tower that was eight stories and 38 meters (125 feet) tall (UC Berkeley 2009).

Alternative 4, Leased Facility on San Pablo Avenue

The leased facility site is located in a highly urbanized area and is surrounded largely by industrial uses, although some residences are present on 67th Street and San Pablo Avenue. Given the density and nature of development in the area around the facility, persons with views of the facility are not expected to be sensitive to changes at the site.

Alternative 5, No Action

Under this alternative, OSF would continue to use the building in Oakland with no changes made to the existing building.

4.2.7 Air Quality

Proposed Action

The LBNL area is subject to air quality planning programs developed in response to both the Federal Clean Air Act (CAA) and the California Clean Air Act (CCAA). Within the San Francisco Bay Area, air quality is monitored, evaluated, and regulated by the U.S. Environmental Protection Agency (US EPA), the California Air Resources Board (CARB), and Bay Area Air Quality Management District (BAAQMD). The LBNL site is located in Alameda County, which, along with eight other counties, is within the San Francisco Bay Area Air Basin (SFBAAB or Basin).

Air pollutants typically are categorized as criteria pollutants or toxic air contaminants (TACs). The criteria pollutants are those regulated at the federal level by US EPA and at the state level by CARB. These include ozone (O_3), respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), carbon monoxide (CO), oxides of nitrogen (NO_x), sulfur dioxide (SO_2), and lead (Pb). O_3 is a secondary pollutant formed during photochemical reactions with precursor pollutants. As such, O_3 is measured by assessing emissions of its precursors, reactive organic gases (ROG) and NO_x.

Air pollutants are emitted by a variety of sources, including mobile sources such as automobiles; stationary sources such as manufacturing facilities, power plants, and laboratories; and area sources such as homes and commercial buildings. Sources of criteria pollutants at the LBNL site include vehicles, heating and cooling equipment, and emergency generators.

TACs are airborne pollutants for which there are no air quality standards but that are known to have adverse human health effects. Examples include aromatic and chlorinated hydrocarbons, certain metals, and asbestos. Adverse health effects can be carcinogenic, short-term (acute) noncarcinogenic, and long-term (chronic) noncarcinogenic. TACs are generated by a number of sources, including stationary sources such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources such as automobiles and trucks, particularly diesel-fueled vehicles; and area sources, such as farms, landfills, construction sites, and residential areas. Sources of TACs around the LBNL site include diesel buses and trucks, laboratory vent emissions, boilers in individual buildings, emergency generators, and painting operations.

Certain groups of people are considered more sensitive to adverse effects from air pollution than the general population. These groups are termed sensitive receptors. Sensitive receptors include children, the elderly, and people with existing health problems who are more often susceptible to respiratory infections and other air quality-related health problems. Residences, schools, childcare centers, hospitals, and nursing homes are all considered sensitive receptors. Air pollution impacts are assessed, in part, based on potential effects on sensitive receptors.

Air quality in the Basin is monitored by the BAAQMD and CARB. Based on pollutant concentrations measured at monitoring stations within the Basin, the SFBAAB is classified as being in attainment or non-attainment of federal and state air quality standards. The SFBAAB is designated nonattainment for the state O_3 1-hour standard, the federal O_3 8-hour standard, the state PM_{10}, and the state $PM_{2.5}$ standards. The SFBAAB was recently designated non-attainment for the new federal $PM_{2.5}$ standard. For all other federal and state standards, the SFBAAB is in attainment or unclassified.

The Proposed Action site is located in the southwestern portion of the LBNL site and is approximately 208 meters (685 feet) from the Foothill Student Housing Complex, which is the nearest off-site sensitive receptor to the southwest of the site, and about 240 meters (790 feet) from the multi-family residences that are the nearest off-site sensitive receptors to the west.

Alternative 1, Cafeteria Parking Lot Site

This alternative would be located in the same air basin and general geographic area as the Proposed Action, and the same air quality conditions would apply to the site as are described above for the Proposed Action. The alternative site is located upslope of the Proposed Action site and is approximately 335 meters (1,100 feet) from the Foothill Student Housing Complex, the nearest off-site sensitive receptor to the southwest of the site and about 365 meters (1,200 feet) from the multi-family residences, the nearest off-site sensitive receptors to the west.

Alternative 2, RFS Site

This alternative would be located in the same air basin as the Proposed Action, and the same regional air quality conditions would apply to this site as are described above for the Proposed Action. The alternative site is located near the center of RFS and is approximately 460 meters (1,509 feet) from the nearest off-site sensitive receptors in the Marina Bay neighborhood and the residences to the northeast of I-580.

Alternative 3, Former DHS Site

This alternative would be located in the same air basin as the Proposed Action, and the same air quality conditions would apply to this site as are described above for the Proposed Action. The alternative site is about 100 meters (328 feet) from the nearest sensitive receptors, which are the apartments located at

1910 Oxford at the southeast corner of the DHS site (UC Berkeley 2009). Other nearby sensitive receptors are residences located on Hearst Avenue and on Walnut Street.

Alternative 4, Leased Facility on San Pablo Avenue

This alternative would be located in the same air basin as the Proposed Action, and the same air quality conditions would apply to the site that are described above for the Proposed Action. The alternative site is located about 30 meters (82 feet) from the nearest sensitive receptors on 67th Street and approximately 40 meters (132 feet) from the nearest sensitive receptors on San Pablo Avenue.

Alternative 5, No Action

This alternative would be located in the same air basin and general geographic area, and the same air quality conditions would apply to the site as are described above for the Proposed Action.

4.2.8 Greenhouse Gases

Proposed Action

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere and influence the earth's temperature. This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate. While the emission of GHGs in general, and CO_2 in particular, into the atmosphere is not of itself an adverse environmental effect, the increased concentrations of GHGs in the atmosphere due to human activities and the associated changes in global climate, represent adverse environmental effects.

The most common GHGs are carbon dioxide and water vapor. However six gases have been identified as the principal contributors to human-induced global climate change are carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). GHGs are released into the earth's atmosphere through a variety of human activities, including combustion of fossil fuel in transportation, electrical generation, and industrial processes, and certain agricultural activities.

Efforts are underway at the international, national, state, and local levels to control the emissions of GHGs. In 2006, Assembly Bill 32 (AB 32) was signed into law by the Governor. AB 32 requires that California cap its GHG emissions at 1990 levels by 2020. This legislation requires CARB to establish a program for statewide GHG emissions reporting and monitoring/enforcement of that program. CARB is also required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions.

The Proposed Action site is undeveloped at this time. No uses that generate GHG emissions are present on the site. GHG emissions are currently generated at the OSF site in Oakland (see **Alternative 5**, **No Action** below). With the implementation of the Proposed Action, the operations that generate these emissions would transfer to the new location on the LBNL site. This change is discussed in **Section 5.0, Environmental Consequences**.

Alternative 1, Cafeteria Parking Lot Site

Because climate change is a global phenomenon, the same conditions that are described above for the Proposed Action would apply to this alternative. This site is a parking lot, a land use that does not directly generate any GHG emissions.

Alternative 2, RFS Site

Because climate change is a global phenomenon, the same conditions that are described above for the Proposed Action would apply to this alternative. The site at RFS is undeveloped at this time. No uses that generate GHG emissions are present on the site.

Alternative 3, Former DHS Site

Because climate change is a global phenomenon, the same conditions that are described above for the Proposed Action would apply to this alternative. The site was formerly occupied by a building that has been demolished recently. No uses that generate GHG emissions are present on the site at this time.

Alternative 4, Leased Facility on San Pablo Avenue

Because climate change is a global phenomenon, the same conditions that are described above for the Proposed Action would apply to this alternative. The site is developed with a building. Therefore, some amount of GHG emissions is currently associated with this site.

Alternative 5, No Action

The existing operation of OSF at its present site generates approximately 11,325 $MTCO_2e$ per year. Under the No Action alternative, these emissions would continue to occur.

4.2.9 Noise

Proposed Action

Within the boundaries of the LBNL site, ambient noise levels are generated by vehicular traffic on the road network; heating, ventilation and air conditioning equipment associated with buildings; and other stationary equipment such as pumps, cooling towers, generators, and machine shop equipment. Ongoing construction projects also raise noise levels in the vicinity of the construction sites.

Sensitive receptors are noise-sensitive locations where project construction or operational noise could be experienced and could detract from or interfere with normal activities. Certain land uses are considered more sensitive to ambient noise levels than others are. Typical sensitive receptors include residences, schools, medical facilities, parks, and outdoor recreation areas.

The Proposed Action site is located in the western portion of the LBNL site, and is flanked by Buildings 70 and 70A to the east, the Building 50 complex to the north, and Cyclotron Road, the Blackberry Canyon entrance gate, and the 88-inch Cyclotron to the west. LBNL is surrounded by a mix of land uses, including open space; institutional, residential, and commercial uses; the UC Berkeley campus; and the Tilden Regional Park. The noise sensitive receptors located off the LBNL site that are closest to the CRT facility site are students who live in the Foothill Student Housing Complex located below and about 208 meters (685 feet) to the southwest of the project site. The Greek Theater, an entertainment venue on the campus, is located adjacent to Foothill Student Housing Complex. There are also multi-family residences and the Tibetan Nyingma Institute located approximately 240 meters (790 feet) west of the Proposed Action site along Highland Place.

Noise in the project area results primarily from vehicular traffic on the road network. Noise from intermittent high-altitude jet aircraft overflights also contributes to the ambient noise levels. Measured noise levels are shown in **Table 4.0-1, Measured Noise Levels in the Project Vicinity,** and measurement locations are shown on **Figure 4.0-3, Noise Measurement Locations and Location of Sensitive Receptors**. Noise measurements are reported in A-weighted sound level or dB(A).

Data for Site 11 represents the project site. The average noise level measured at the project site during the daytime was 66 dB(A) L_{eq}, and noise levels ranged from 48 dB(A) L_{90} to 83 dB(A) L_{max}. Site 2, at the Foothill Student Housing parking lot above the housing on Cyclotron Road, represents the noise environment at that receiver location for the closest sensitive receptor to the CRT site off the LBNL site. During the daytime, the average noise level was 57 dB(A) L_{eq}, and noise levels ranged from 49 dB(A) L_{90} to 67 dB(A) L_{max}. During midday, the average noise level measured was 52 dB(A) L_{eq}, and noise levels ranged from 49 dB(A) L_{90} to 64 dB(A) L_{max}. Site 3 was at the north side of the Tibetan Nyingma Institute, representing another sensitive receptor. The average daytime noise level at this site was 48 dB(A), and noise levels ranged from 46 dB(A) L_{90} to 57 dB(A) L_{max}. The Nyingma Institute adjoins Hearst Avenue. The south and west facades of the building and outdoor areas on the south and west sides of the building would be oriented towards the CRT construction site and are also oriented towards Hearst Avenue. Ambient noise measurements along Hearst Avenue at Highland Place near the Nyingma Institute show an average noise level of 64 dB(A), with noise levels ranging from 57 to 80 dB(A) as vehicle traffic fluctuates.

Table 4.0-1
Measured Noise Levels in the Project Vicinity

		Noise Level in dB(A)[a]			
Site No.[b]	**Measurement Location**	L_{eq}	L_{max}	L_{10}	L_{90}
Based on 15-Minute Noise Measurement Data					
1	299 Panoramic Way	46	53	NM	NM
2	Foothill Parking Lot	57	67	58	49
3	Tibetan Nyingma Institute (n. side)	48	57	49	46
4	LBNL Building 76	68	81	68	64
5	LBNK Building 85	53	72	51	46
6	LBNL Building 74	64	81	63	59
7	LBNL Buildings 62 and 63	54	71	53	45
8	LBNL Buildings 6 and 7	58	68	60	54
9	LBNL Building 71	60	74	62	46
10	LBNL Buildings 56 and 61	52	61	54	49
11	LBNL Building 65	66	83	70	48
12	LBNL Building 70A	58	73	59	50
13[c]	End of Canyon Road	58	68	60	53
14[c]	Hearst Avenue at Highland Place	64	80	55	57

a L_{eq} = equivalent steady-state noise level over a 1-hour period produced by the same noise energy as the variable noise levels during that period; L_{max} = instantaneous maximum noise level; L_{10} = noise level exceeded 10 percent of the time; L_{90} = noise level exceed 90 percent of the time.

*b Measurement locations correspond to those shown in **Figure 4.0-3**.*

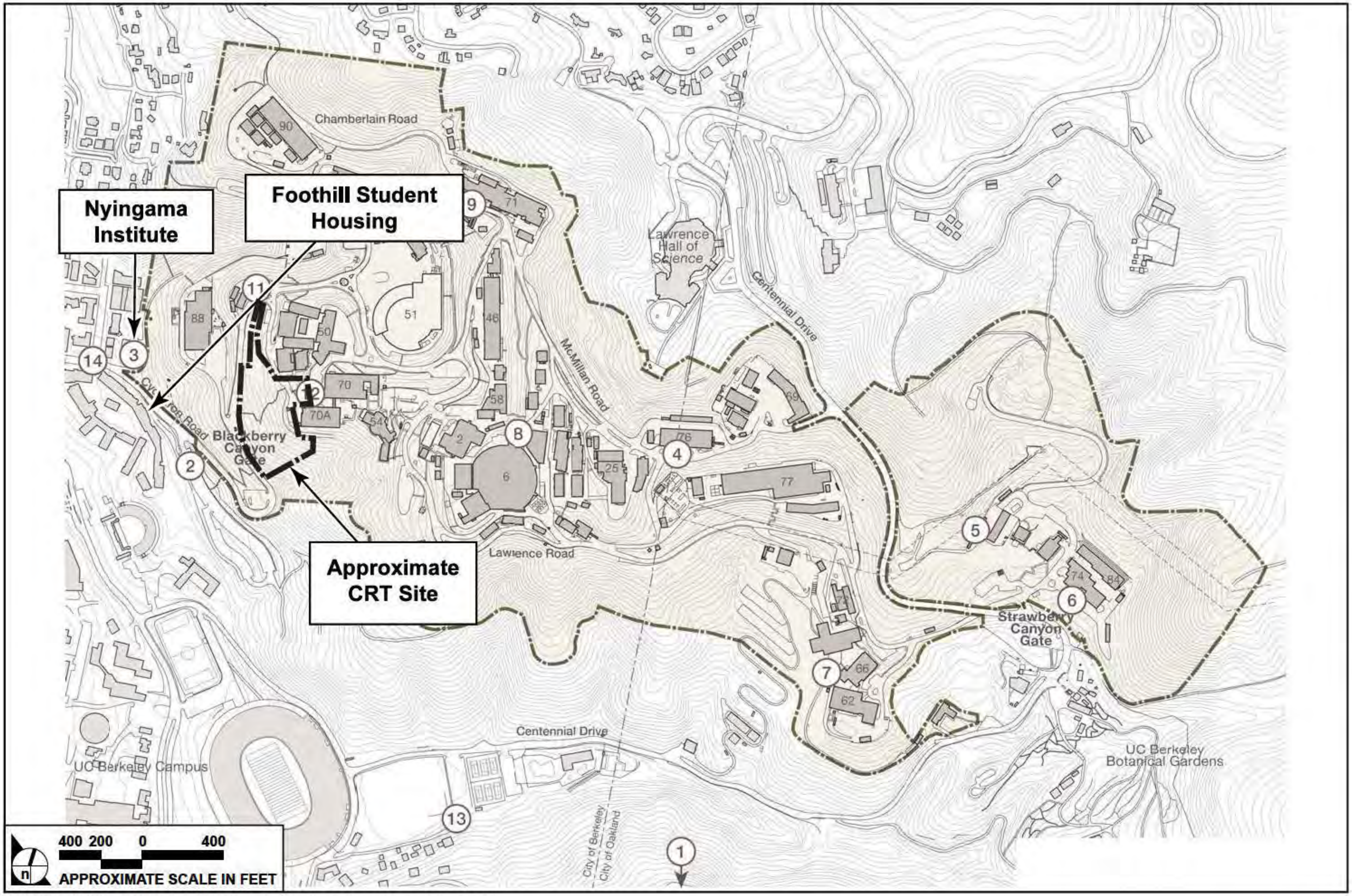
c Noise measurement reported in UC Berkeley LRDP EIR, Table 4.9-3.

NM = Not Measured

Source: Environmental Science Associates 2003 and 2004; UC Berkeley 2004.

Alternative 1, Cafeteria Parking Lot Site

Please refer to noise setting information for the Proposed Action. This alternative site is located upslope, to the east of the Proposed Action site, and therefore is more than 335 meters (1,100 feet) from the Foothill Student housing and 366 meters (1,200 feet) from the Tibetan Nyingma Institute, the two nearest off-site sensitive receptors.



SOURCE: LBNL; ESA – 2007, Perkins+Will – September 2007, Impact Sciences, inc. – February 2010

FIGURE 4.0-3

Noise Measurement Locations and Location of Sensitive Receptors

924-002•07/10

Alternative 2, RFS Site

Traffic noise on the street network and I-580 freeway dominates the noise environment at RFS; although the central portion of the RFS is distant from the roadways and adjacent industrial uses, and the ambient noise levels in this area are low. Land uses surrounding the RFS are largely industrial. A residential neighborhood, Marina Bay neighborhood, is located to the southwest of the RFS. However, this neighborhood is at least 460 meters (1,500 feet) from the alternative site, which is located near the center of the RFS. There are several intervening buildings between the alternative site and the homes in this neighborhood, and a clear line of sight is not available.

Alternative 3, Former DHS Site

In the vicinity of the alternative site, traffic noise on the street network dominates the noise environment. Along Shattuck Avenue, typical hourly average noise levels range from 68 to 71 dB(A) during the daytime and drop to about 55 dB(A) at night. The measured day/night average noise (L_{dn}) level on Shattuck Avenue in the Campus Park area was 71 dB(A) L_{dn}. Short-term measurements made along other streets in the areas adjacent to the Campus Park showed similar noise levels (UC Berkeley 2009).

Alternative 4, Leased Facility on San Pablo Avenue

Traffic noise on the street network dominates the noise environment in the vicinity of the alternative sites. Noise levels around the project site are generally high due to traffic volumes along San Pablo Avenue. The alternative site is located approximately 30 meters (82 feet) from the nearest noise-sensitive receptors, which are residences on 67th Street, and 40 meters (132 feet) from the noise-sensitive residences on San Pablo Avenue. Given the volume of traffic on San Pablo Avenue, noise levels are expected to range from 68 to 70 dB(A) during the daytime hours, dropping to 45 to 50 dB(A) at night.

Alternative 5, No Action

The OSF site is located in uptown Oakland adjacent to two major arterials. Therefore, traffic noise dominates the noise environment in the vicinity of the OSF site and noise levels are expected to range from 68 to 70 dB(A) during the daytime hours, dropping to 45 to 50 dB(A) at night.

4.2.10 Transportation and Traffic

Proposed Action

The LBNL site is located close to three regional highways: Interstate 80/580 about 5 kilometers (3 miles) to the west and State Routes (SR) 24 and 13 about 3 kilometers (2 miles) to the south. Access to I-80/580 is via arterial roads in the City of Berkeley and Oakland, including University Avenue, Ashby Avenue, Hearst Avenue, Gayley Road, and College Avenue. Access to SR-24 and SR-13 is via Tunnel Road.

The LBNL site is served by three roadway entrances: (1) the Blackberry Canyon Gate, which is the main entrance to the site and is on Cyclotron Road, north of the intersection of Hearst Avenue and Gayley Road in the southwestern portion of the LBNL site; (2) Strawberry Canyon Gate, which is located at the eastern end of the LBNL site and is accessed via Centennial Drive; and (3) Grizzly Peak Gate, located along the northern boundary of LBNL and accessed via Centennial Drive. Internal circulation on the LBNL site is provided by an east-west roadway system that generally follows the site contours.

Traffic counts conducted in 2002 indicated that roughly 5,700 one-way vehicle trips are generated daily by the approximately 4,000 employees at the LBNL site (LBNL 2007). Approximately 40 percent of UC LBNL staff use alternative (i.e., non-single occupancy vehicle) modes of transportation, including LBNL shuttle, bicycle, Bay Area Rapid Transit (BART), and carpool.

Level of service (LOS) is a general measure of traffic operating conditions, whereby a letter grade from A (the best) to F (the worst) is assigned to roadway intersections. These grades represent the comfort and convenience associated with driving from the driver’s perspective. To assess the worst-case traffic conditions, LOS is measured during morning (generally 7:00 AM to 9:00 AM) and afternoon (generally 4:00 PM to 6:00 PM) peak commute times. The LOS standard for City of Berkeley intersections is LOS D. Of the four intersections that are near the LBNL site and would likely experience Proposed Action-related traffic increases, two intersections—Stadium Rimway/Gayley Road and Bancroft Way/Piedmont Avenue—operate at LOS E and F respectively under existing conditions.

The City of Berkeley has established designated truck routes to manage the movement of construction vehicles on its streets. The designated truck routes that would be used by construction vehicles associated with LBNL projects, including the proposed project, are shown in **Figure 4.0-4, Designated Truck Routes To and From LBNL.** In 2009, UC LBNL conducted a study of the truck routes. This study found that under existing conditions, the four most congested intersections along the truck route operate at acceptable LOS (LOS D or better under City of Berkeley standards) during the AM peak hour. During the PM peak hour, however, three of the four intersections operate at unacceptable levels.

SOURCE: Fehr and Peers 2009, Impact Sciences, Inc. – February 2010

FIGURE 4.0-4

Designated Truck Routes To and From LBNL

924-006•07/10

Alternative 1, Cafeteria Parking Lot Site

Traffic conditions for the Alternative 1 site are similar to those described above for the Proposed Action.

Alternative 2, RFS Site

The RFS site is accessible via I-80 and I-580. There are three interchanges on I-580 that provide access to the RFS–Marina Bay Parkway interchange, Regatta Boulevard interchange, and Bay View Avenue interchange. Regatta Boulevard and Frontage Road provide access to the RFS main entrance gate at 46th Street. The Regatta Boulevard interchange is about 0.56 meter (0.35 mile) from the main entrance and provides the most direct access to and from the freeway (UC Berkeley 2003). The intersection of Regatta Boulevard and Meade Street is the only major intersection between the Regatta interchange and the RFS main gate. This intersection is signalized and currently operates at an acceptable LOS.

The RFS site is served by Alameda-Contra Costa Transit District (AC Transit) bus number 71, which links the RFS to Richmond BART station, and by the AC Transit RFS bus, that provides service between RFS and the El Cerrito Del Norte BART station.

Alternative 3, Former DHS Site

The regional traffic conditions for the DHS site are similar to those described for the Proposed Action, although intersections affected by the alternative are in the area of downtown Berkeley. According to the UC Berkeley 2020 LRDP EIR, the following intersections in the City of Berkeley near the former DHS site currently operate at unacceptable conditions (LOS E or LOS F) during the morning and/or evening peak hours:

- San Pablo Avenue and Marin Avenue
- University Avenue and Sixth Street
- University Avenue and San Pablo Avenue.
- Bancroft Way and Piedmont Avenue,
- The Derby Street and Warring Street
- Gilman Street and Sixth Street intersection

The site is three city blocks away from the Downtown Berkeley BART station, and is also accessible by a number of AC Transit bus lines.

Alternative 4, Leased Facility on San Pablo Avenue

Similar to the LBNL site, the 16791 San Pablo Avenue site is accessible from several regional highways: Interstate 80/580 about 0.9 kilometer (0.5 mile) to the west or 2.6 kilometers (1.6 miles) to the south, and SR-24 about 3.3 kilometers (2.0 miles) to the east. Access to I-80/580 is via Ashby Avenue to the west and via San Pablo Avenue to the south. Access to SR-24 is via Ashby Avenue and Tunnel Road east of the alternative site. The site is approximately 1.6 kilometers (1 mile) west of the Ashby BART station, and is also accessible by six AC Transit bus lines, including 9, 72, 72R, 72M, 802, and J.

According to the Traffic Analysis prepared for the *West Berkeley Project Draft EIR*, the intersections of Ashby Avenue and San Pablo Avenue and Ashby Avenue and Seventh Street operate at LOS D under existing conditions (Wilbur Smith Associates 2010).

Alternative 5, No Action

The alternative involves continued leasing of the existing OSF in Oakland. The OSF is located in uptown Oakland at the corner of Franklin and 20th Streets, adjacent to the 19th Street Oakland BART station. The traffic on Broadway, Franklin, and 20th Streets is moderately heavy. However, all nearby intersections operate at acceptable levels of service.

4.2.11 Utilities and Waste Management

Proposed Action

The facility to be constructed under the Proposed Action would be served by existing utility providers at the LBNL site. All of the utilities that would be needed for the Proposed Action are available in the vicinity of the site.

East Bay Municipal Utility District (EBMUD) provides high-pressure potable and fire protection water at the LBNL site. On the LBNL site, water is distributed by an extensive water distribution system, which provides water not only to the buildings but also for use in cooling towers, for irrigation, and for other uses. In 2003, the total annual water consumption at the LBNL site was approximately 41.6 million gallons. Even though the total building space at LBNL has increased, water usage has declined substantially since 1990 because of water conservation measures that LBNL has implemented in the past few years (LBNL 2008).

Wastewater generated at the LBNL site is collected in a gravity-flow system that eventually discharges into the City of Berkeley's sanitary sewer system through a monitoring station located at Hearst Avenue and a second monitoring station located at Centennial Drive. The volume and quality of effluent at both monitoring stations is monitored and evaluated for compliance with EBMUD discharge requirements. From these monitoring stations, the discharge continues down into the City's sewer system to be transported to EBMUD's north interceptor sewer and then to the wastewater treatment facility in Oakland. Effluent from the western portion of the LBNL site, including effluent from the CRT site area, flows to the Hearst Monitoring Station, from where it ties into the City of Berkeley's sewer system at City sanitary sewer sub-basin 17-013. Sub-basin 17-013 is not currently constrained during peak wet weather flows (LBNL 2008).

UC LBNL implements an extensive program focused on waste minimization and recycling. A recycling contractor collects all non-hazardous and non-recyclable solid waste generated at LBNL and transports it to a collection facility in Richmond, California, from where the waste is hauled to the Altamont Landfill (LBNL 2008). The landfill has 45,720,000 cubic yards of remaining capacity, which is expected to be available through 2029 (Department of Resources Recycling and Recovery 2010).

UC LBNL purchases electricity through the Western Area Power Administration. Electricity is delivered to LBNL's Grizzly Peak substation via the Pacific Gas & Electric Company (PG&E) transmission system. The Grizzly Peak substation consists of two DOE-owned transformers with a combined capacity of 100 MW. This substation is exclusively for LBNL use. In addition, power can be supplied to LBNL from UC Berkeley's Hill Area substation, located adjacent to the Grizzly Peak substation. The on-site power distribution system at LBNL consists of a 12.47-kV underground system with smaller substations and transformers to reduce voltage. Total electrical power consumption at LBNL in 2006 was 71,100-megawatt hours (MWh). The LBNL site also has a number of stationary and portable emergency electrical generators that are powered by diesel, gasoline, or natural gas. Implementation of the Proposed Action would require upgrades to the existing electricity infrastructure, including modifications at the LBNL Grizzly Peak substation. The electricity for the Proposed Action would be routed through the Grizzly Peak substation and transmission facilities within the LBNL site.

The natural gas supply for the LBNL site is provided by Defense Fuel Supply Center in Oregon gas and delivered by the PG&E system for heating buildings, to operate certain equipment, and for some experimental uses (LBNL 2008). The LBNL natural gas system receives its supply from a 6-inch PG&E line operating at 50 pounds per square inch gauge (psig). The point of delivery is a meter vault with automatic shut off valves near the Foothill parking lot. From the point of delivery, a 6-inch medium pressure gas main provides gas service to the LBNL site. This gas main crosses the Proposed Action site from Cyclotron Road to a point between Buildings 50D and 70A. This gas line would be relocated approximately 100 feet to the north to allow construction of the proposed facility, and new connections would be established to serve the project.

CRD owns and operates the Energy Sciences Network (ESnet) data network that provides a high-speed computer-based communication and information-sharing network for scientists working on DOE-sponsored research.

Alternative 1, Cafeteria Parking Lot Site

The existing utilities infrastructure at the LBNL site is described under the Proposed Action above. All of the necessary utilities are available in the vicinity of the alternative site.

Alternative 2, RFS Site

The RFS is connected to the City of Richmond and local utilities for water, sewer, electric power, and natural gas. EBMUD serves the RFS with one 8-inch domestic water line and two 12-inch fire main lines. These lines enter the RFS from the north, west, and east sides of the property (UC Berkeley 2008).

The Richmond Municipal Sewer District provides wastewater treatment and disposal services to the RFS. Sewer discharge from the RFS flows to the City of Richmond publicly owned wastewater treatment plant, located approximately 3-miles west on Canal Boulevard (UC Berkeley 2008).

PG&E provides electricity to the RFS through an overhead 12-kilovolt electrical line service, with both underground and aerial power lines comprising the electrical service infrastructure. PG&E also provides natural gas service to the RFS through a high-pressure gas main on South 46th Street (UC Berkeley 2008).

Beyond the basic utilities provided at the time of purchase, UC Berkeley installed additional support at the RFS as needed, such as water and sanitary sewer service for restrooms, laboratories, and research projects (UC Berkeley 2008).

On-site stormwater drainage currently flows from the north to the south at the RFS by way of open swales, culverts, and sheet flow into drainages. The storm drain system consists of two main storm drain lines located on the eastern and western sides of the RFS property. An underground line in the central portion of the RFS connects these two systems (UC Berkeley 2008).

The RFS site would require installation of ESnet infrastructure as well as major improvements to electrical transmission facilities, including installation of new power lines (using existing electrical poles or spare conduits) and a substation adjacent to the CRT building at the alternative site.

Alternative 3, Former DHS Site

EBMUD supplies water to the University-owned distribution system from its supply lines and meters along the periphery of the Campus Park. A 20-inch-diameter EBMUD water main runs along Hearst Avenue, Gayley Road, Piedmont Avenue, and Bancroft Way. A 48-inch-diameter water main runs west under Hearst Avenue and Bancroft Way, and south along Oxford Street (UC Berkeley 2009).

Campus wastewater is treated by EBMUD, which has a National Pollutant Discharge Elimination System (NPDES) Direct Discharge permit to discharge treated wastewater into the San Francisco Bay. EBMUD imposes effluent guidelines and discharge limitations on the campus via the local EBMUD ordinance and by the EBMUD discharge permit issued to the campus (UC Berkeley 2009).

The DHS site is not adequately served by high-speed and high-bandwidth networking infrastructure. In addition, the site does not have adequate electricity infrastructure, and upgrades would be needed to meet the power demands under the alternative.

Alternative 4, Leased Facility on San Pablo Avenue

The facility to be leased includes adequate services for water, wastewater, and waste disposal. The site would require installation of ESnet infrastructure as well as major improvements to electrical transmission facilities, including installation of new power lines (using existing electrical poles or spare conduits) and a substation adjacent to the CRT building at the alternative site.

Alternative 5, No Action

The alternative would continue to use the existing OSF site. The facility has adequate services and infrastructure to meet existing demands. The existing facility demands approximately 9.69 million gallons of water per year.

4.2.12 Public Services

Proposed Action

The Proposed Action site is provided public services by UC Berkeley, Alameda County, and other public agencies in the area as described below.

UC LBNL contracts for firefighting services with the ACFD, which staffs a fire station on the LBNL site. The ACFD has mutual aid agreements with other agencies, including the cities of Berkeley and Oakland

and the East Bay Regional Park District. Assistance under these agreements can be activated in the event of a major emergency (LBNL 2008).

Law enforcement services at the LBNL site are provided through a contract with the UC Berkeley Police Department (UCPD). UCPD also coordinates with the City of Berkeley Police Department and the Oakland Police Department.

The Berkeley Unified School District (BUSD) and Oakland Unified School District (OUSD) provide public elementary and secondary school services to dependents of UC LBNL personnel who live in these two communities.

The East Bay Regional Park District (EBRPD) manages a variety of properties, including regional parks, recreational areas, wilderness, shorelines, preserves, and land bank areas within Alameda and Contra Costa counties. The EBRPD regional park properties in the vicinity of the LBNL site include Tilden Park and the Claremont Canyon Preserve. The cities of Berkeley and Oakland also own and/or maintain parks in the vicinity of the LBNL site.

Alternative 1, Cafeteria Parking Lot Site

Please refer to the Proposed Action setting, above.

Alternative 2, RFS Site

UCPD provides law enforcement services at the RFS. UCPD has a mutual aid agreement with the Richmond Police Department. The Richmond Fire Department provides fire protection services for the RFS. Station 64 is the closest station and is located approximately 0.8 kilometer (0.5 mile) east of the alternative site. West Contra Costa Unified School District provides public elementary and secondary school services to school-aged dependents of employees who live in the City of Richmond, adjacent to the alternative site. The EBRPD Bay Trail lies adjacent to the southern boundary of the RFS site.

Alternative 3, Former DHS Site

UCPD provides law enforcement services to the campus, including the former DHS site, with assistance from the City of Berkeley Police Department. The BFD provides fire protection and emergency medical services to a portion of the UC property, including the alternative site. Primary response to the campus area from BFD comes from Station Number 2 at 2129 Berkeley Way. Stations 3 and 5 at 2710 Russell Street and 2680 Shattuck Avenue, respectively, offer supplemental support. The Berkeley Unified School District (BUSD) and Oakland Unified School District (OUSD) provide public elementary and secondary school services to dependents of UC LBNL personnel who live in these two communities.

Alternative 4, Leased Facility on San Pablo Avenue

The BFD provides fire protection and emergency medical services, and the City of Berkeley Police Department provides law enforcement services to the alternative site. The Berkeley Unified School District (BUSD) and Oakland Unified School District (OUSD) provide public elementary and secondary school services to school-aged dependents of employees who live near this site.

Alternative 5, No Action

Fire and law enforcement services are provided to the OSF by the City of Oakland's Fire Department and Police Department, respectively. The BUSD and OUSD provide public elementary and secondary school services to school-aged dependents of UC LBNL personnel who live in these two communities.

4.2.13 Population and Housing, Socioeconomics, and Environmental justice

Proposed Action

The Proposed Action would be located in Berkeley within the San Francisco Bay Area. There were approximately 7.3 million people estimated to live in the nine-county Bay Area region in 2010. The region's population grew at a compound rate of 0.8 percent per year from 2000 to 2010. The Bay Area also experienced substantial decreases in employment opportunities in the 2000s. The number of jobs decreased at a compound rate of –0.7 percent per year, declining from 3.8 to 3.5 million jobs in the nine-county region in 2010 (ABAG 2009). In 2003, there were 3,800 people employed at LBNL (LBNL 2007).

In accordance with guidance from Executive Order 12898, census data were examined to determine whether minority and low-income populations occur in high concentrations in the area of potential effect of the Proposed Action. To determine whether high concentrations of minority or low-income populations are present, demographic and income data for the census tracts (Census Tracts 4216, 4224, 4225, 4226) surrounding the site were compared to the same data for Alameda County as a whole. The data showed that in Alameda County, approximately 59.1 percent of the population is minority, defined as all individuals except white, non-Hispanic persons (U.S. Census Bureau 2000). Minority populations of the census tracts near the CRT facility site range from 19.7 percent to 61.3 percent non-white persons, with only one census tract slightly exceeding the County's average.

With respect to evaluation of the presence of low-income population, data regarding the median household income and percentage population below poverty line were examined. According to the 2000 Census, the 1999 median household income for Alameda County as a whole was $55,946.

Households in all but one-study area census tracts had median household incomes that were much lower than the County average. In addition, while approximately 11 percent of the County population was below the poverty line, several study area census tracts contained a higher percentage of population below the poverty line compared to the County average (U.S. Census Bureau 2000).

Alternative 1, Cafeteria Parking Lot Site

This alternative site is also located in the western portion of the LBNL site, and the regional conditions described for the Proposed Action above apply to this alternative.

Alternative 2, RFS Site

This alternative site is located in the City of Richmond within the Bay Area region, and the regional conditions described above for the Proposed Action also apply to this alternative. The area surrounding the RFS site includes low-income and minority neighborhoods, although, as noted earlier, there are no residential neighborhoods immediately adjacent to the alternative site.

Alternative 3, Former DHS Site

This alternative site is located in the downtown area of the City of Berkeley within the Bay Area region, and the regional conditions described above for the Proposed Action also apply to this alternative. To determine whether high concentrations of minority or low-income populations are present, demographic and income data for the census tracts (Census Tracts 4224, 4225, 4226, and 4229) surrounding the site were compared to the same data for Alameda County as a whole. The data showed that in Alameda County, approximately 59.1 percent of the population is minority, defined as all individuals except white, non-Hispanic persons (U.S. Census Bureau 2000). Minority populations of the census tracts near the former DHS site ranged from 29 percent to 45 percent non-white persons (U.S. Census Bureau 2000), which is less than the County average.

With respect to evaluation of the presence of low-income population, the median household income and percentage population below poverty line were examined. According to the 2000 Census, the 1999 median household income for Alameda County as a whole was $55,946. Households in all study area census tracts had median household incomes that were much lower than the County average. In addition, while approximately 11 percent of the County population was below the poverty line, all of the study area census tracts contained a higher percentage of population below the poverty line compared to the County average (U.S. Census Bureau 2000).

Alternative 4, Leased Facility on San Pablo Avenue

This alternative site is located in the cities of Berkeley, Emeryville and Oakland within the Bay Area region, and the regional conditions described above for the Proposed Action also apply to this alternative. The area surrounding the leased facility site comprises industrial uses; the nearest residential uses are located 30 meters (82 feet) away. To determine whether high concentrations of minority or low-income populations are present, demographic and income data for the census tracts (Census Tracts 4240.02, 4232, 4008, 4251) surrounding the site were compared to the same data for Alameda County as a whole. The data showed that in Alameda County, approximately 59.1 percent of the population is minority, defined as all individuals except white, non-Hispanic persons (U.S. Census Bureau 2000). Minority populations of the census tracts near the San Pablo Avenue site ranged from 51 percent to 73 percent non-white persons (U.S. Census Bureau 2000), which would be greater than the County average.

With respect to evaluation of the presence of low-income population, the median household income and percentage population below poverty line were examined. According to the 2000 Census, the 1999 median household income for Alameda County as a whole was $55,946. Households in all study area census tracts had median household incomes that were much lower than the County average. In addition, while approximately 11 percent of the County population was below the poverty line, all of the study area census tracts contained a higher percentage (13 to 28 percent) of population below the poverty line compared to the County average (U.S. Census Bureau 2000).

Alternative 5, No Action

This alternative is also located in the Bay Area region, and the regional conditions described above for the Proposed Action also apply to this alternative.

4.2.14 Construction Traffic Accidents

Accidents are discussed in various different sections of this EA. For accidents due to earthquakes and landslides, see **subsections 4.2.1** and **5.1, Geology and Soils**. For information about risks from hazardous materials and wildland fires, and a description of emergency response, see **subsections 4.2.3** and **5.3, Hazards, Human Health, and Accidents**. Traffic accidents related to construction trucks are discussed below.

Proposed Action

Accident data for collisions involving trucks along the designated truck route in Berkeley between 2002 and 2004 was obtained from the Department of California Highway Patrol (CHP) and analyzed.

Table 4.0-2 shows roadway names, segment lengths, total number of collisions involving trucks over the three year period of analysis, average number of accidents per year, and the number of accidents where fault was attributed to the truck driver. As shown in the table, the total number of accidents involving trucks is low and the number of accidents where fault was attributed to the truck driver is even lower.

Table 4.0-2
Collisions Involving Trucks Along the Designated Truck Route (2002–2004)

Roadway	Length of Segment	All Accidents		Truck Driver at Fault	
		Total	Per Year	Total	Per Year
University Avenue (Oxford St. to I-80)	2.19	17	5.7	10	3.3
Oxford Street (University Ave. to Hearst Ave.)	0.12	1	0.3	1	0.3
Hearst Avenue (Shattuck Ave. to Highland Pl.)	0.72	1	0.3	1	0.3

US Department of Energy 2010

Alternative 1, Cafeteria Parking Lot Site

The alternative would involve the same truck route for construction trucks as those described above for the Proposed Action.

Alternative 2, RFS Site

The alternative site is close to I-80/580. Construction trucks stop at only one major intersection, Syndicate Street and Meade Street, between the RFS main gate and the Regatta interchange.

Alternative 3, Former DHS Site

Trucks from the Alternative 3 site would use the same truck route as the trucks from the LBNL site. Therefore, collision data presented in **Table 4.0-2** would apply to the former DHS site.

Alternative 4, Leased Facility on San Pablo Avenue

The Alternative 4 site is located approximately 0.9 kilometer (0.5 mile) from Interstate 80/580. Trucks from the Alternative 4 site would use access to I-80/580 via San Pablo Avenue and Ashby Avenue. According to the *West Berkeley Project Draft EIR*, the intersections of Ashby Avenue and San Pablo Avenue and Ashby Avenue and Seventh Street operate at LOS D under existing conditions (Wilbur Smith Associates 2010).

Alternative 5, No Action

There would be no construction trucks associated with the No Action Alternative.

5.0 ENVIRONMENTAL CONSEQUENCES

This section presents the environmental consequences from the implementation of the Proposed Action and each of the alternatives that is carried forth for detailed evaluation in this Environmental Assessment (EA). As explained in **Sections 2.0** and **3.0** of this EA, the U.S. Department of Energy's (DOE) purpose is to relocate and consolidate all Advanced Scientific Computing Research (ASCR) – funded and other related programs in one location that is on or near the Lawrence Berkeley National Laboratory (LBNL) site. This purpose can be attained by constructing a new building to house the programs or by leasing and/or renovating existing buildings to provide the necessary space. As explained in **Section 3.0**, the University of California (UC or the University) has proposed to construct a new building to house the relocated and consolidated programs on the LBNL site. The construction of the building under the Proposed Action is therefore a consequence of the DOE's proposed federal action. Similarly, the construction of the building at the Richmond Field Station (RFS) and the California Department of Health Services (DHS) alternative sites and the renovation of the leased building in Berkeley would be a consequence of the DOE's proposed federal action. This section of the EA evaluates not only the Proposed Action's direct effects (such as changes in traffic with the relocation of staff) but also the indirect effects from the construction and renovation activities that would be triggered by the federal action (such as the effects on cultural and biological resources from the construction of a new building).

As explained in **Section 3.0**, the University determined that the Computational Research and Theory (CRT) facility is an element of the growth projected under the 2006 Long Range Development Plan (LRDP) and, in compliance with the California Environmental Quality Act, (CEQA), the University evaluated the building project for its environmental impacts in an EIR (State Clearinghouse [SCH #] No. 2007072106) that was certified in 2008 (LBNL 2008). In conjunction with its approval of the proposed CRT building, the University adopted project-level measures that have already been incorporated into the design of the facility. The University also incorporated into the proposed building project relevant standard project features (SPFs) from the 2006 LRDP EIR that are incorporated into all LBNL projects. The full text of these SPFs that are a part of the CRT facility project is provided in **Appendix 1**, herein, and these SPFs are referred to in resource subsections of **Section 5.0**, herein. The analysis presented below evaluates environmental impacts that would result from project implementation following the application of these SPFs. These SPFs are also applicable to and made part of Alternative 1 (Cafeteria parking lot site). Similarly, construction of the CRT facility at the former DHS site (Alternative 3) would be subject to the UC Berkeley 2020 LRDP. For these three alternatives, environmental consequences are evaluated below, as they would result following the implementation of the pertinent SPFs. With respect to Alternative 2 (RFS site) and Alternative 4 (leased facility on San Pablo Avenue), although not binding on these two sites, LBNL SPFs would be adopted voluntarily for these two sites and applied by the University.

5.1 GEOLOGY AND SOILS

5.1.1 Proposed Action

Seismicity and Faults

As noted in **subsection 4.2.1**, the Proposed Action site is located within the Earthquake Fault Zone defined for the Hayward fault by the State of California pursuant to the Alquist-Priolo Earthquake Fault Zoning Act. However, a fault investigation did not identify any active fault traces at the CRT building site (Kleinfelder 2006, 2008, and 2009). As the Proposed Action site is not underlain with any active faults, there would be no potential for effects from fault rupture at the site.

In compliance with California Geological Survey (CGS) Special Publication 117 (Guidelines for Evaluating and Mitigating Seismic Hazards) and LBNL's "Force Design Criteria RD3.22," the CRT facility has been designed to resist seismic loading. The design ground motions shall have no more than a 2 percent chance of being exceeded within a 50-year period. In addition, the University has established and would implement, as part of the project, a process for the design of new buildings that applies the best available engineering technologies to maximize safety and resiliency. Under this process, the facility design would be evaluated by UC LBNL to ensure that it complies with the provisions of California Code of Regulations (CCR) Title 24, California Building Standards Code, or local seismic requirements, whichever requirements are more stringent.[1] Although conformance to the highest seismic provisions does not constitute a guarantee that structural damage would not occur in the event of a maximum credible earthquake, it is reasonable to expect that structures built in compliance with the seismic requirements would not collapse or cause loss of life in a major earthquake.

The facility under the Proposed Action would also include provisions for adequate anchorage for seismic resistance of nonstructural building elements (including, but not limited to, glass, fixtures, furnishings, and other contents, equipment, material storage facilities, and utilities [gas, high-temperature water, steam, fire protection water, etc.]) which would minimize potential hazards to persons in the event of seismic events. In order to reduce the risk of injury during seismic events, employees at LBNL are trained regularly so that they are prepared to respond to an emergency. In addition, the LBNL job hazards questionnaire recommends that new employees take a 1.5-hour earthquake/wildland fire safety course to teach employees how to take the appropriate actions to protect themselves from the harmful effects of a

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[1] See http://www.ucop.edu/facil/fmc/facilman/volume1/rpsafety.html for more details.

major earthquake (or wildland fire) in the San Francisco Bay Area (Bay Area). This includes education of all UC building occupants (LBNL 2008). Response equipment for use by LBNL employees would be maintained on the Proposed Action site, and fire and police services are located in the vicinity of Proposed Action site.

The LBNL Master Emergency Program Plan (LBNL 2005) outlines the procedure for assessing damages to buildings and infrastructure following large seismic events. Following major earthquakes, the LBNL Damage Assessment Team, composed of engineers and the Department of Environmental Health and Safety (EH&S) safety specialists, will inspect buildings for structural and other infrastructure damage.

Liquefaction, Landslides, Erosion, and Soil Instability

The Proposed Action site is not located in an area underlain by liquefiable soils, as shown in **Figure 5.0-1, Seismic Hazard Zone Map**. Therefore, there would be no effects from liquefaction at the site. The Proposed Action site is located in a CGS-defined seismic landslide hazard area, and shallow landslide deposits have been identified at the project site, including a shallow landslide (less than 8 feet deep)[2] that underlies a portion of the building site. The site-specific geotechnical investigation recommended that the proposed structure be supported by a combination of spread footings directly on bedrock and piers drilled at least 10 feet into the underlying bedrock. These recommendations have been included in the facility design (Kleinfelder 2007). In addition, as noted in the description of the Proposed Action, the landslide underlying the building site would be removed and replaced with engineered fill as part of the Proposed Action before the building is constructed. A seismic slope stability investigation conducted at the project site in accordance with CGS SP 117 concluded that there is a low probability of earthquake-induced slope failure within bedrock. Based on the data acquired and reviewed for this study, Kleinfelder found that from a geologic viewpoint, it is feasible to construct the proposed CRT building at the site. Kleinfelder's previous subsurface investigations and most recently published references indicate that there is a relatively low potential for seismically induced landslides to occur at the CRT site (Kleinfelder 2010).

Additional instability of underlying soil units may also be attributed to differential settlement, soil creep, or the triggering of localized slumps or landslides in response to grading at the site. The site-specific design will minimize differential settling and structural impacts due to hillslope soil creep, which would reduce the effects related to soil instability.

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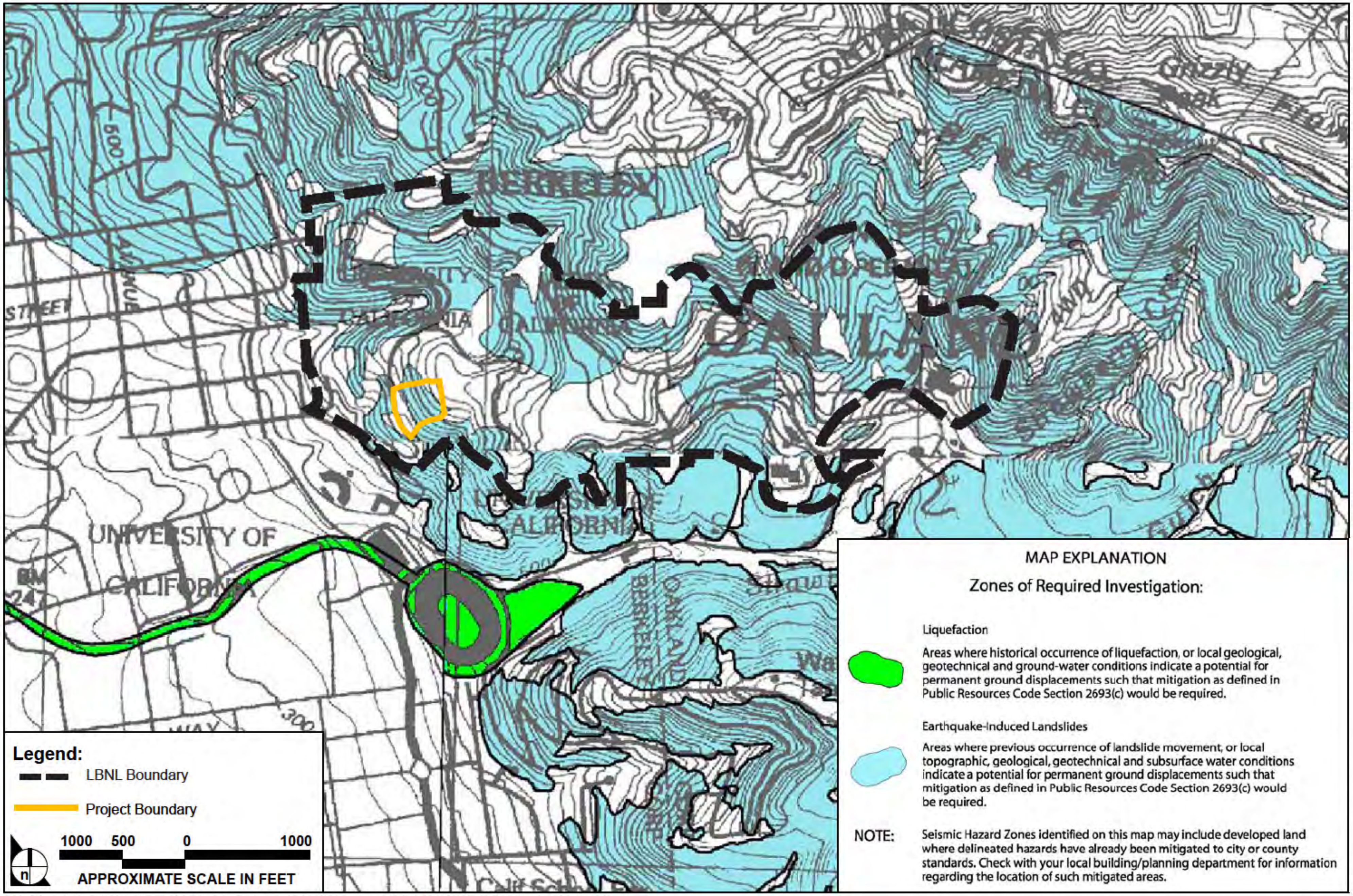
2 Kleinfelder, Inc., 2009, Fault Investigation, Computation Research and Theory Building, Lawrence Berkeley National Laboratory, Berkeley, California, Revision No. 1, May 13, 2009, Consulting report prepared for LBNL, p. 10.

The building is proposed in an area of very steep slopes (an average slope of 2:1, horizontal to vertical), and therefore the site would be highly susceptible to erosion during construction. Furthermore, construction would involve substantial cuts and fills and earthmoving activities, which could result in erosion. Soil erosion can lead to increased turbidity in the receiving waters, sedimentation, and damage to aquatic habitats. Construction-related erosion would be controlled and reduced by implementation of control measures, including but not limited to the use of erosion control blankets and silt fences, covering of excavation piles, and storm drain inlet protection, in compliance with a project-specific Storm Water Pollution Prevention Plan (SWPPP) required under the Clean Water Act and UC LBNL standard contract specifications. Furthermore, in compliance with UC LBNL's standard contract specifications and LBNL SPFs GEO-3a and 3b, all disturbed areas would be revegetated with native plants following completion of the project. The environmental effects from erosion would be avoided by implementation of these required contract specifications and SPFs.

5.1.2 Alternative 1, Cafeteria Parking Lot Site

There is no potential for fault rupture at this site. Given the proximity of the Alternative 1 site to the Hayward fault, the potential for seismic shaking would be high. As with the Proposed Action, the new facility at this site would be required to comply with the provisions of CCR Title 24, California Building Standards Code, or local seismic requirements, whichever requirements are more stringent. The University would implement the same design process as described under the Proposed Action, which would require application of the best available engineering technologies to maximize safety and resiliency. Therefore, with respect to faults and seismic shaking, the alternative would be similar to the Proposed Action.

The potential for landslides and liquefaction at this site is low. As with the Proposed Action, the facility design would minimize indirect effects related to soil instability. Construction-related erosion would be controlled and reduced by implementation of control measures including but not limited to the use of erosion control blankets and silt fences, covering of excavation piles, and storm drain inlet protection, in compliance with a project-specific Storm Water Pollution Prevention Plan (SWPPP) required under the Clean Water Act and LBNL standard contract specifications. Furthermore, in compliance with LBNL's standard contract specifications and LBNL SPFs GEO-3a and 3b, all disturbed areas would be revegetated with native plants following completion of the project. The environmental effects from erosion would be avoided by implementation of these required contract specifications and SPFs.



SOURCE: California Department of Conservation, California Geologic Survey, 2003; LBNL 2006 Long Range Development Plan

FIGURE 5.0-1

Seismic Hazard Zone Map

5.1.3 Alternative 2, RFS Site

There are no faults present on or very near the RFS site and therefore there is no potential for fault rupture effects. Based on maps prepared by Association of Bay Area Governments, the RFS site has moderate to low liquefaction potential, and soil borings in the central portions of the RFS site indicate that the potential for liquefaction in the central portion is low (UC Berkeley 2003). Furthermore, the University would implement the same design process as described under the Proposed Action, which requires application of the best available engineering technologies to maximize safety and resiliency, and adherence to the requirements of the CBC. This process would minimize the risk to the CRT facility seismic ground shaking and liquefaction at the RFS. Because the RFS site is flat, the potential for landslide and soil instability effects is low.

5.1.4 Alternative 3, Former DHS Site

There are no faults present on the DHS site and therefore there is no potential for fault rupture effects. Due to the proximity to the Hayward fault, this site would also experience substantial ground shaking in the event of a large earthquake on the fault. The University would implement the same design process as described under the Proposed Action, which would require application of the best available engineering technologies to maximize safety and resiliency. Implementation of continuing campus best practices, including compliance with the UC Policy on Seismic Safety and incorporation of geotechnical recommendations that reduce hazards, would reduce risks to people and structures from ground-shaking hazards. The DHS site is not located in a liquefaction hazard zone or in an area of landslide risk or soil instability. Because the DHS site is flat and completely developed with a building and pavement, the potential for landslide, soil instability, and erosion effects is minimal. Erosion impacts would also be further reduced through compliance with a project-specific Storm Water Pollution Prevention Plan (SWPPP) required under the Clean Water Act, which would require measures such as storm drain inlet protection and covering of stockpiles.

5.1.5 Alternative 4, Leased Facility on San Pablo Avenue

The building proposed for lease was constructed by the Marchant Calculator Company in 1956 and has been improved since to comply with current building codes. Since the building is in a low liquefaction hazard zone, the risk for damage to the building and equipment as a result of seismic ground shaking would be low. Because the Alternative 4 site is flat and completely developed with a building and pavement, the potential for landslide, soil instability, and erosion effects is minimal.

5.1.6 Alternative 5, No Action

The existing OSF was constructed in 1964 and was constructed in accordance with the applicable building codes. The risk of potential damage to the building in response to a significant earthquake would be similar to the other alternatives. The potential for damage from liquefaction is low, according to the ABAG Liquefaction Susceptibility Map (ABAG 2009).

5.2 WATER RESOURCES

5.2.1 Proposed Action

Since the Proposed Action would not involve groundwater withdrawal, it would not result in any effects on groundwater supplies. Due to the steep slope and relatively clay-rich soils, the site is not an area of significant groundwater recharge under existing conditions, so the potential for the Proposed Action to interfere with groundwater recharge would be low. Furthermore, the Proposed Action would infiltrate storm water to the maximum extent practicable. Groundwater flow paths that do exist at the site are unlikely to be affected, as the building will extend a maximum of 25 feet below the ground surface, above the level at which groundwater is typically observed near the site.

Development under the Proposed Action would alter surface drainage patterns on the site and could result in increased peak flows and induce flooding in downstream reaches. Construction of impervious surfaces on areas currently occupied primarily by vegetated open space would, without appropriate controls, decrease stormwater infiltration at the site and result in increased peak flow and volume of flow in downstream receiving channels. These increases (often referred to as "hydromodification") can, in turn, increase the frequency of erosive events in downstream channels. The effects are typically most prominent for the smaller rainfall events that occur more frequently on a yearly or decadal basis. However, all stormwater from newly created impervious areas at the Proposed Action site would be directed to storm drain systems that discharge to the North Fork of Strawberry Creek. Potential increases in Strawberry Creek flows for 10-, 25-, 50-, and 100-year storms would be controlled by the hydromodification vaults that are included in the project design. The vaults would release storm water at a rate no greater than storm water discharged under the pre-development conditions.

UC LBNL currently employs, and would continue to employ, a wide array of construction-phase storm water best management practices (BMPs) to minimize the potential for accidental discharges of fill or other materials into surface waters and to comply with NPDES requirements. Active management of construction-related stormwater flows from development sites is a part of LBNL standard contract specifications on all construction projects undertaken by UC LBNL. Construction projects incorporate control measures and are monitored to manage stormwater flows and potential discharge of pollutants.

With the development and implementation of a project-specific SWPPP (including a project-specific erosion control plan) as described above in **subsection 5.1.1** and the controls required by LBNL standard contract specifications, the potential for accidental discharge of pollutants to surface or groundwater during construction of the CRT facility would be minimized.

ABAG maps of tsunami danger indicate that the site is well outside any tsunami hazard zone. The site is also outside the 100-year flood plain and the area that is projected to be inundated due to a sea level rise associated with climate change. Given the topography and elevation of the site, the CRT facility would not be at risk of inundation from a creek, seiche, tsunami, mudflow, or sea level change.

5.2.2 Alternative 1, Cafeteria Parking Lot Site

Implementation of the CRT facility at the Alternative 1 site would result in substantially similar hydrology and water quality effects as the Proposed Action. Although the Alternative 1 site is already developed with impervious surfaces, and therefore the CRT facility would generate only a small increase in surface runoff at this site, hydromodification vaults would be constructed as part of the CRT facility to control peak flows and flooding. Compliance with LBNL construction-phase storm water BMPs and NPDES requirements would reduce effects related to erosion, sedimentation, and water quality.

ABAG maps of tsunami danger indicate that the site is well outside any tsunami hazard zone. The site is also outside the 100-year flood plain and the area that is projected to be inundated due to a sea level rise associated with climate change.

5.2.3 Alternative 2, RFS Site

The CRT facility site at RFS is currently undeveloped, and therefore the facility would add new impervious surfaces that would generate increased storm water runoff. Due to the site's location very near the San Francisco Bay, hydromodification effects of this increased runoff are not a concern for this site. Water quality could be affected by the runoff generated from the CRT parking lot. However, compliance with NPDES requirements would minimize water quality effects. Construction-phase water quality impacts would be addressed by the project-specific SWPPP that would be implemented in compliance with NPDES requirements.

The proposed facility would also result in increased impervious surfaces at the RFS site that could reduce groundwater recharge. However, given the proximity of the site to the bay, groundwater quality is affected by salt-water intrusion and is not used for water supply.

ABAG maps of tsunami danger show that only the marshland in the southern portion of RFS is in a tsunami inundation area (ABAG 2010). CRT construction at RFS, which is in the upland area, would not therefore place personnel at undue risk from tsunamis. In addition, according to the sea level rise map prepared by the San Francisco Bay Conservation and Development Commission (BCDC), the CRT site is not at risk from inundation due to sea level rise in the next century (BCDC 2008b).

5.2.4 Alternative 3, Former DHS Site

The DHS site is an infill site on flatlands. Because the site is already developed with impervious surfaces, the construction of the CRT facility at this site will not generate any new storm water. Construction-phase water quality effects would be addressed by the SWPPP that would be implemented in compliance with NPDES requirements.

ABAG maps of tsunami danger indicate that the site is well outside any tsunami hazard zone. In addition, according to the sea level rise map prepared by BCDC, the site is not at risk from inundation due to sea level rise in the next century (BCDC 2008a).

5.2.5 Alternative 4, Leased Facility on San Pablo Avenue

The construction of the additional floor, interior modifications, and installation of cooling equipment at the Alternative 4 site would not increase the overall impervious surfaces at the site because it would take place within the already impervious building footprint. Therefore, this alternative would not result in an increase in storm water runoff. According to the sea level rise map prepared by BCDC, the site is not vulnerable to inundation from sea level rise in the next century (BCDC 2008a).

5.2.6 Alternative 5, No Action

The use of the existing OSF would not result in environmental effects related to water resources. ABAG maps of tsunami danger and BCDC's map of projected sea level rise indicate that the site is well outside any tsunami or sea level rise hazard zone (BCDC 2008a).

5.3 HAZARDS, HUMAN HEALTH, AND ACCIDENTS

5.3.1 Proposed Action

Hazardous Materials

Construction workers would not be exposed to soil or groundwater contamination during excavation, as none is present at the site. Construction workers would be exposed to safety and health hazards associated with use of heavy equipment and handling of hazardous substances used during construction, hazards that are typical of construction sites. Potential impacts to the health and safety of the workers would be minimized by adherence to applicable federal, state, and local regulations, Occupational Safety and Health Administration regulations, and general contractor safety plans. Electrical work would conform to applicable electrical and fire code requirements. No unusual construction site considerations are expected during construction, equipment installation, and maintenance of the proposed facility and associated infrastructure. Existing employees at the LBNL site and the general public would not be exposed to health and safety hazards during construction of the CRT facility.

The CRT facility operations would not involve the routine use, storage, or transport of hazardous materials. A non-chemical treatment system would be used to control scaling in the facility's cooling towers. The only hazardous materials on site would be battery acid from batteries used to provide backup power to operate the computers in the event of a power outage, and about 1,000 gallons of diesel. The diesel would be stored in two 500-gallon belly tanks, one for each emergency generator. The tanks would be required to have secondary containment and monitoring to comply with applicable federal and state regulations. Sealed batteries would be kept in a ventilated room on the lower mechanical level and would be collected and recycled at the end of their useful lives. Compliance with applicable federal, state, and local regulations would minimize exposure to hazards during operation. Safety precautions would include wearing the proper protective equipment when handling the batteries, air monitors, and double containment of the batteries.

As discussed in **subsection 3.1.10** of this EA, at the end of the new building's useful life, the building would be vacated and either demolished and the site restored to a hillside, or rebuilt to the applicable construction standards. If the building were demolished, utility systems would be shut off, any potential sources of environmental contamination inside the building would be removed, and the interior contents would be removed and recycled, all before demolition takes place. It is anticipated that there would be no hazardous or radioactive building waste material, conventional demolition methods would be used for demolition, and controls would be implemented to protect the workers and the environment. Prior to demolition of the building, an analysis would be conducted to verify whether environmental impacts would result from building demolition and to assess what level of further National Environmental Policy Act (NEPA) review, if any, would be appropriate. NERSC equipment that reaches the end of its useful life would be removed from the site by a licensed subcontractor and would be recycled as appropriate. Therefore, if the facility is demolished, it is anticipated that there would be minimal environmental impacts related to hazards and human health.

Emergency Response

The CRT facility would be designed to ensure that occupants can safely leave the building in case evacuation is necessary. The majority of the occupants of the CRT building would exit via the stairwells and bridge to the parking area outside Buildings 70 and the 50 complex. Occupants using the stairwell on the west face of the building would exit to the Building 50 stairs and would assemble in the parking lot of Building 88. Once occupants reached the assembly areas, the LBNL sitewide evacuation plan would be used. In the event that a fault rupture would cause the failure or blockage of Cyclotron Road, evacuees would be directed (and, if necessary, assisted) to evacuate on foot by way of the Building 50 stairs to the UC Berkeley campus.

Placement of the CRT facility at the Proposed Action site would not result in changes to evacuation routes of neighborhoods near the LBNL site. In the event of evacuation by vehicle, traffic control would be provided on Centennial Drive and Cyclotron Road, which are potential evacuation routes, by UC LBNL and UC Berkeley to ensure orderly evacuation of all persons in the area (LBNL 2008).

Wildland Fires

Although both the proposed building and the new population associated with the new building could be exposed to the risk from wildland fires, the risks of loss, injury, or death involving wildland fire are not expected because the building would be designed and constructed in conformance with the requirements defined by the California Building Code, Type I Fire Resistive Construction, and with fire code safety requirements. The building would be fitted with automatic sprinklers. Risk from building fires would be minimized through compliance with the state fire code. Furthermore, in compliance with LBNL's vegetation management program, fire-resistant ground cover would be installed as needed for erosion control in the areas surrounding the building and the access driveway. Vegetation management to reduce fuel loads would continue to be conducted on all areas near the project site, as well in other open space areas of LBNL site. All new employees on the LBNL site would be provided training and information regarding measures to be taken in the event of a fire. The fire station on the LBNL site is within 1,500 feet of the project site and would be adequately staffed to serve this facility along with other existing and proposed facilities on the LBNL site (LBNL 2008).

5.3.2 Alternative 1, Cafeteria Parking Lot Site

There is no known soil or groundwater contamination at the Alternative 1 site. Potential impacts to the health and safety of workers, the public, and the environment would be minimized by adherence to applicable federal, state, and local regulations; general contractor safety plans; and proper handling, storage, and disposal of contaminated soil and groundwater, should any be encountered. Fire hazards, emergency response, and other hazards would be the same as the Proposed Action. Risk from building fires would be minimized through compliance with the state fire code. Therefore, environmental and human risks related to hazards under this alternative would be similar to the Proposed Action site.

5.3.3 Alternative 2, RFS Site

A portion of the RFS site has been remediated for various metals that had exceeded site-specific human and ecological target levels and soil management and groundwater monitoring programs are in place to ensure ecological and human safety (UC Berkeley 2008). However, a portion of the site is contaminated with pyrite cinders that are currently being investigated by UC Berkeley. It is anticipated that the University would remediate the site entirely, in compliance with DTSC requirements, prior to development. Potential impacts to the health and safety of construction workers would be minimized by adherence to applicable federal, state, and local regulations and general contractor safety plans. Therefore, the proposed CRT facility would be safely developed at this site and would not expose facility users or construction workers to unsafe levels of contamination.

The RFS also has an emergency response plan that includes evacuation routes, similar to the LBNL. Given the geography of the site near a marsh, the risks of wildland fires at the site are substantially lower than at the Proposed Action site. Risk from building fires would be minimized through compliance with the state fire code.

5.3.4 Alternative 3, Former DHS Site

A combination of salvage, decommissioning, and hazardous materials removal steps were implemented at the vacated DHS building. The remaining decontamination, hazardous materials removal, and demolition will be completed by the University prior to the construction of the Helios Energy Research Facility project (UC Berkeley 2009). Potential impacts to the health and safety of construction workers would be minimized by adherence to applicable federal, state, and local regulations and general contractor safety plans. Therefore, existing on-site contamination is not a concern for the CRT facility should it be constructed at the DHS site.

Similar to the LBNL site, UC Berkeley has an emergency response plan that includes evacuation routes; this plan would apply to the CRT facility. Given the location of the DHS site is in a flat, urban setting, the risk for wildland fires to occur at or near the site is low. Risk from building fires would be minimized through compliance with the state fire code.

5.3.5 Alternative 4, Leased Facility on San Pablo Avenue

The alternative would not involve any ground disturbing activities because the construction would be limited to the addition of another floor to the existing building and interior modifications to existing floors in the building. Therefore, any soil or groundwater contamination that may be present on site is not a concern for the alternative. Similar to the Proposed Action, compliance with applicable federal, state, and local regulations and general contractor safety plans would minimize exposure to hazards during construction and operation. An emergency response plan would be prepared for the Alternative 4 site that would include evacuation routes; this plan would apply to the CRT facility. Given its location in a densely developed urban setting, there is no risk for wildland fires to occur at or near the site. Risk from building fires would be minimized through compliance with the state fire code.

5.3.6 Alternative 5, No Action

The use of the existing OSF would not expose CRT facility users to hazards. An emergency response plan has been prepared for the existing facility. Given the location of the site is in a flat, urban setting, the risk for wildland fires to occur at or near the site is low. As with the Proposed Action, compliance with applicable federal, state, and local regulations and general contractor safety plans would minimize exposure to hazards during operation.

5.4 BIOLOGICAL RESOURCES

5.4.1 Proposed Action

The following discussion addresses effects from construction of a new building, which would be a consequence of the Proposed Action.

There are no wetlands or other features potentially subject to the jurisdiction of regulatory agencies such as USACE, USFWS, and CDFG present on the Proposed Action site. However, the North Fork of Strawberry Creek, a known habitat for Lee's micro-blind harvestman (*Microcina leei,* a species designated as "Special Animal" by the State of California) occurs approximately 37 and 107 meters (120 and 350 feet), to the north of the project site. Additionally, willow riparian scrub habitat associated with Cafeteria Creek occurs approximately 34 meters (110 feet) to the south of the project site. The project has been designed with a minimum setback of at least 24 meters (80 feet) from Cafeteria Creek. In addition, construction-phase BMPs specified in construction contracts at LBNL would minimize the potential for accidental discharges of fill or other materials into jurisdictional waters and sensitive habitats.[3] In addition, LBNL SPF BIO-2c, which requires construction projects to avoid ground disturbing activities during the rainy season, is part of the Proposed Action and would further reduce the potential for accidental discharge into sensitive habitats such as the creeks.

Excavation, grading, and construction activities would result in the removal of approximately 2.25 acres of vegetation, including a eucalyptus stand and mixed grassland vegetation. Approximately 75 trees would be removed, including species of eucalyptus, coast live oak, and California bay tree. The vegetation types that would be removed are common throughout the Oakland-Berkeley hills and are predominantly non-native species. Furthermore, consistent with the LBNL design standards and guidelines, which require that all trees to be removed be replaced at a 1:1 ratio, replacement trees would be planted on the project site and elsewhere at LBNL.

Tree removal activities have the potential to affect active special-status bird nests (including raptors), and special-status bats. Special-status bats that may occur on or near the project site include pallid bat (*Antrozous pallidus*), fringed myotis (*Myotis thysanodes*), and long-eared myotis (*Myotis evotis*); the first is a state species of concern and the other two are state Special Animals. Removal of trees could result in the destruction of special-status bat roosts and any unusually loud noise levels generated by project construction activities could result in the abandonment of an active maternity bat roost and active bird nests. The loss of active maternity roosts and active nests of special-status bird species would be avoided through implementation of LBNL SPF BIO-4, which requires Pre-Construction Special-Status Bat Surveys and Subsequent Actions, and SPF BIO-3, which involves pre-construction surveys and implementation of additional measures in case active nests are encountered. UC LBNL would also comply with the Migratory Bird Treaty Act and Section 3503 of the California Fish and Game Code.

The Proposed Action site is not within or contiguous to any U.S. Fish and Wildlife Service (USFWS) designated Critical Habitat for the Alameda whipsnake (*Masticophis lateralis euryxanthus*, a species listed as threatened at both the state and federal levels). Numerous biological surveys have been conducted of the Proposed Action site and its surroundings, including a June 28, 2007, site-specific suitability analysis of the Proposed Action site for Alameda whipsnake. In the latter analysis, the Proposed Action site was found to be nearby to areas containing high-quality Alameda whipsnake habitat. Specifically, coastal scrub vegetation and open space grasslands occur along south-facing slopes to the south of the project site. While core habitat does not occur within the project boundary and Alameda whipsnake is not expected to permanently reside there, and while the species has never been observed on or adjacent to the

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3 A sensitive habitat is defined as any area in which plant or animal life or their habitats are either rare or especially valuable. Sensitive habitat areas include, but are not limited to, riparian corridors, wetlands, marine habitats, sand dunes, sea cliffs, and habitats supporting rare, endangered, and unique species.

Proposed Action site, it is possible that the species may temporarily occur on or nearby to the Proposed Action site (LBNL 2008).

UC LBNL has developed several SPFs for preventing the incidental taking of the Alameda whipsnake during construction and similar activities at the LBNL site. These SPFs were developed over a period of years and are based on site visits and informal consultation with the USFWS along with the assistance of biologists specializing in the Alameda whipsnake species. Implementation of LBNL SPFs BIO-5(a) through BIO-5(f) as part of the Proposed Action would ensure that the species is protected during construction and that no loss of individual whipsnakes would occur. In addition, DOE has completed an informal consultation with the USFWS and found that there is no potential for adverse effect on whipsnakes.

Infrastructure improvements to provide adequate electricity and utilities to the CRT facility at the Proposed Action site would involve installation of power lines in existing underground conduits and modifications at the Grizzly Peak substation. These improvements would be constructed within LBNL road rights of way and on the substation site where biological resources are not present.

5.4.2 Alternative 1, Cafeteria Parking Lot Site

Similar to the Proposed Action, implementation of required measures for construction activities at LBNL would minimize the potential for accidental discharges of fill or other materials into jurisdictional waters and sensitive habitats during the construction of the facility at the Alternative 1 site.

The Alternative 1 site is mostly paved and contains fewer trees in comparison to the Proposed Action Implementation of the alternative would remove approximately 30 trees. The vegetation at the site is also considered to be common throughout the area. Given that Alternative 1 involves removal of fewer trees, the effects on nesting bird habitat and special-status bats would be slightly reduced. In addition, less potential habitat for the Alameda whipsnake occurs at this site. LBNL SPFs that are part of the Proposed Action would also be implemented in conjunction with Alternative 1. As with the Proposed Action, infrastructure improvements would be constructed in areas where no biological resources are present.

5.4.3 Alternative 2, RFS Site

The habitat on the alternative site is composed of disturbed non-native and native dominated grassland on fill, ornamental trees, eucalyptus trees, and a drainage ditch/swale. No federally protected wildlife or plant species is known to occur on the alternative site. The drainage/swale along the eastern side of the CRT facility site at RFS may be subject to U.S. Army Corps of Engineers (USACE) and/or California Department of Fish and Game (CDFG) jurisdiction. If it is determined that the drainage feature qualifies as a jurisdictional feature, it would be avoided. If avoidance is not feasible, compliance with federal and state regulations and implementation of LBNL SPFs that would be voluntarily applied under this alternative would reduce the environmental effects related to the swale. It is anticipated that most of the trees on the site would remain under Alternative 2, and only a few trees if any would be removed. The removal of active nests and nest abandonment due to construction noise and effects on special status bats would be avoided through implementation of LBNL SPF BIO-3, which involves pre-construction surveys and implementation of additional measures in case active nests are encountered, and of LBNL SPF BIO-4, which would help protect special-status bats. UC LBNL would also comply with the Migratory Bird Treaty Act and Section 3503 of the California Fish and Game Code.

In addition, Alternative 2 would potentially affect the sensitive natural communities—California Oatgrass Bunchgrass Grassland (*Danthonia californica*), and purple needlegrass (*Nassella pulchra*)—that are present on the site. Although these species are not federally protected, implementation of LBNL SPFs BIO-6a and 6b, involving floristic surveys for special-status plants, which are included in the alternative, would minimize this effect.

Infrastructure improvements, especially to provide adequate electricity and Energy Sciences Network (ESnet) service to the CRT facility at the RFS site would involve installation of cables, installation of power lines on existing poles or in existing conduits, and a substation. These improvements would be constructed within road rights of way and on the proposed CRT site at RFS. Construction of these facilities would result in similar biological effects as described above from the construction of the CRT facility.

5.4.4 Alternative 3, Former DHS Site

Due to the extent of past development, there is no remaining natural vegetation on the site and in the vicinity. Therefore, the Alternative 3 site does not provide suitable habitat for special-status plant or animal species, and no sensitive natural communities, special status species, wetlands, or important wildlife movement corridors occur in the vicinity (UC Berkeley 2009). Therefore, biological resources would not be affected by construction and operation of Alternative 3, including infrastructure improvements to serve the project.

5.4.5 Alternative 4, Leased Facility on San Pablo Avenue

The alternative consists of leasing and renovating an existing building in a densely developed urban area. The site is fully developed with a building, parking lot, and driveways and contains no natural vegetation that could support wildlife or special status plant species (see **Figure 3.0-8**). The three ornamental trees on the site are small and do not provide nesting habitat for birds. The surrounding area is also similarly developed with urban uses and no natural habitat is present in the areas adjoining the site. Infrastructure improvements to serve the CRT facility would be located on the project site and in city streets. Therefore, this alternative would not affect sensitive biological resources.

5.4.6 Alternative 5, No Action

The existing facility in Oakland is in an existing building. The site is developed with a building, parking lot and a driveway and contains no natural vegetation that could support wildlife or special status species (see **Figure 3.0-9**). All adjacent parcels are similarly intensely developed with urban uses and no natural habitat is present on or near the site.

5.5 CULTURAL RESOURCES

5.5.1 Proposed Action

The following discussion addresses effects from construction of a new building, which would be a consequence of the Proposed Action.

Construction activities related to the Proposed Action would not directly or indirectly affect any buildings or structures that qualify as historic resources. The project would require modifications to an exterior stairway extending from the Blackberry gate to Building 50. The stairway is known locally as the Seaborg stairway. However, the wooden stairway structure is not currently listed in any register of historic resources, and is not considered eligible for listing in the National Register of Historic Places or the State Office of Historic Preservation's California Register of Historical Resources because it is an unexceptional wooden stairway that has been extensively modified over the years. Although the stairway is named after a Nobel laureate, there is no specific association of the stairway with the Nobel laureate or the research conducted by him (**Appendix 2**). Furthermore, the construction of the proposed building would not directly or indirectly affect any historic structures nearby because with the exception of Building 88, none of the other buildings adjacent or nearby to the Proposed Action are eligible for inclusion in the National Register of Historic Places. Building 88, which is separated from the CRT site by Cyclotron Road, a grove of eucalyptus trees, and sloping terrain, may be eligible for inclusion in the National Register of Historic Places. However, the potential significance of Building 88 lies in the scientific accomplishments or events that took place within the facility. The Proposed Action would not affect Building 88. Given its distance from Building 88 and the intervening busy roadway, trees, and terrain, any effect of the Proposed Action on the Building 88 viewscape would be minimal. The SHPO confirmed that Buildings 65, 70 and 70A are not eligible for National Register listing and that Building 88's historic significance would not be affected by the Proposed Action.

A pedestrian survey of the Proposed Action site was conducted by a qualified archaeologist and with the exception of an isolate, which was likely deposited on the site, no archaeological resources were encountered. Based on this survey, and the fact that most of the surrounding area of the project site has been subject to extensive excavation for surrounding buildings and infrastructure, it is unlikely that project construction would encounter archaeological resources (Condor Country Consulting 2010). Any other improvements that involve ground disturbance including installation of infrastructure, would take place on the project site or within LBNL streets, in areas that have been previously disturbed by construction and are unlikely to contain intact archaeological resources. Therefore, the Proposed Action is not likely to affect archaeological resources. In the event of the discovery of any archaeological resources during construction, LBNL SPFs CUL-3 and CUL-4, which are included in the Proposed Action, would require implementation of measures including work stoppage and appropriate treatment of the resources and Native American involvement.

As part of the National Historic Preservation Act Section 106 compliance process, consultation letters were sent to the Berkeley Historical Society, Alameda County Historical Society, the California Native American Heritage Commission, and eight individuals listed on the California Native American Heritage Commission's contact list on March 31, 2010 (**Appendix 2**). No substantive responses to these letters were received as of January 2011, other than one comment from Irene Zwierlin recommending that if an archaeological monitor is recommended and/or artifacts are located, a Native American monitor should be contacted (Condor Country Consulting 2010). Based on the information presented above, the determination has been made that this alternative does not have the potential to cause effects on cultural resources.

5.5.2 Alternative 1, Cafeteria Parking Lot Site

The project site is developed with a parking lot. The unpaved surfaces at the site are also highly disturbed and the likelihood for encountering undisturbed archaeological resources is low. However, if archaeological resources are found at the site or off site in association with installation of infrastructure during construction, LBNL SPFs CUL-3 and CUL-4, which are included in Alternative 1, would require implementation of measures including work stoppage and appropriate treatment of the resources and Native American involvement.

5.5.3 Alternative 2, RFS Site

Implementation of the CRT facility at the Alternative 2 site would not require demolition of any structures. Building 167 is adjacent to the site and would not be affected by construction or operation of Alternative 2. Infrastructure improvements, especially to provide adequate electricity and ESnet service to the site, would involve installation of cables, installation of power lines on existing poles or in existing conduits, and a substation. These improvements would be constructed within road right of ways and on the proposed CRT site at RFS. Although the CRT facility site is in an area that has previously been disturbed by construction and remediation activities, a large portion of this site has not been excavated and the site is close to the San Francisco Bay margins. As noted in **subsection 4.2.5**, Northwest Information Center (NWIC) found that there is a moderate to high potential of encountering prehistoric resources and a moderate potential of encountering historic-period archaeological resources during excavation for the proposed CRT site at RFS. However, as noted in **subsection 3.2.2,** this alternative includes an archival search prior to ground disturbance to determine appropriate locations for archaeological monitoring during site grading. Following removal of top soil, a field inspection would be conducted by a qualified archaeologist who meets the Secretary of Interior's Standards. The archaeologist would provide recommendations for any necessary steps needed to protect archaeological resources. In addition, if unanticipated archaeological resources were found at the site during construction, LBNL SPFs CUL-3 and CUL-4, which are voluntarily included in Alternative 2, would require implementation of measures including work stoppage and appropriate treatment of the resources and Native American involvement.

5.5.4 Alternative 3, Former DHS Site

Given that the site is developed with an existing building and parking lots, the potential to encounter archaeological resources is low. Furthermore, UC Berkeley has evaluated the existing DHS building and determined it not to be a historic resource (UC Berkeley 2009). That building has been removed by the Helios Energy Research Facility project. Any other improvements that involve ground disturbance including installation of infrastructure, would take place on the project site or within city streets, in areas that have been previously disturbed by construction and are unlikely to contain intact archaeological resources. Therefore, the alternative is not likely to affect archaeological resources.

5.5.5 Alternative 4, Leased Facility on San Pablo Avenue

The Marchant building at this alternative site would be altered by the project. According to the records search by and consultation conducted with the NWIC, a 2006 architectural evaluation of the Marchant Building concluded that the building appeared to be potentially eligible for the National Register of Historic Places (**Appendix 2**). This alternative could therefore involve alterations to a potential historic resource.

Any improvements that involve ground disturbance, including installation of infrastructure, would take place on the project site or within city streets, in areas that have been previously disturbed by construction and are unlikely to contain intact prehistoric archaeological resources. Therefore, the alternative is not likely to affect prehistoric archaeological resources.

5.5.6 Alternative 5, No Action

The existing facility would continue to be leased and no historic or prehistoric archaeological resources would be affected under the alternative.

5.6 VISUAL RESOURCES

5.6.1 Proposed Action

The following discussion addresses indirect effects from construction of a new building under the Proposed Action.

The facility to be developed under the Proposed Action would be largely screened by intervening topography, vegetation, and structures. The facility would appear as an incremental addition to the currently developed hillside. Due to surrounding topography, structures, and vegetation, the building would not be prominently visible from many off-site locations. Intervening topography would obstruct views of the building from locations in Strawberry Canyon to the southeast of the project. The Grizzly Peak substation modifications required for the Proposed Action would be visible from Grizzly Peak Road and Centennial Drive but would be changes within the context of an existing substation. Implementation of LBNL SPFs VIS-4a and VIS-4b that are included in the Proposed Action would reduce effects related to light and glare.

5.6.2 Alternative 1, Cafeteria Parking Lot Site

The CRT facility under Alternative 1 would be situated behind an existing building that would largely screen the proposed facility from public views, including the viewpoints noted above. The facility would appear as an incremental addition to the already developed hillside. LBNL SPFs VIS-4a and VIS-4b would be implemented, which would reduce environmental effects associated with light and glare. Infrastructure improvements would be constructed underground within road rights of way and on the proposed CRT site so would not result in any change to existing views.

5.6.3 Alternative 2, RFS Site

Views of the proposed facility at the Alternative 2 site would be largely screened from public views from the Bay Trail and housing by intervening buildings and vegetation. The building would be adjacent to existing structures and would therefore appear as an incremental addition to the existing development at the RFS site. Infrastructure improvements would be constructed underground within road rights of way and on the proposed CRT site at RFS so would not result in any change to existing views.

5.6.4 Alternative 3, Former DHS Site

The existing structures at the DHS site included an eight-story tower that has recently been demolished. Until recently, the DHS site featured an abandoned and undistinguished state institutional laboratory and office building surrounded by asphalt (UC Berkeley 2009). The proposed facility would be constructed on a portion of the existing DHS site footprint. The alternative would likely improve the existing visual character of the site. In addition, requirements under the UC Berkeley LRDP that include lighting design requirements and visual character mitigation measures would be implemented as part of this alternative.

5.6.5 Alternative 4, Leased Facility on San Pablo Avenue

The construction of the additional computer floor at the Alternative 4 site would appear as an incremental addition to the industrial urban setting of the site. The addition would be small in comparison to the existing facility and the facility is in a largely industrial area; thus construction would have a very minimal effect on the visual environment.

5.6.6 Alternative 5, No Action

The No Action alternative would not involve construction of any structures, and as such, would result in no visual changes at the OSF site.

5.7 AIR QUALITY

5.7.1 Proposed Action

Construction of the CRT facility under the Proposed Action is anticipated to commence in early 2011 and continue for approximately 30 months until fall 2013. The project site is currently vacant and would not require demolition operations. Prior to building construction, the entire site would be graded to prepare for asphalt paving and building activities. Fugitive dust PM_{10} would be generated on the project site as a result of earthmoving and grading activities. In addition, criteria air pollutants including reactive organic gases (ROG) and oxides of nitrogen (NO_X), among others, would be emitted by heavy-duty construction equipment. Construction activities would also involve asphalt paving for four handicapped parking spaces. The Proposed Action would not involve the construction of a new parking structure or surface lot. During building construction, emissions would primarily be generated from heavy-duty construction equipment, construction worker trips, and material delivery trips. Although temporary, construction emissions have the potential to cause adverse effects on local air quality in the vicinity of the project site. Once constructed, the Proposed Action would result in operational emissions from the staff vehicle trips to and from the site, boiler operations, emergency generator testing, and general area sources.

Applicable Standards and Thresholds

The air quality impact assessment in this EA has been prepared in accordance with the applicable federal law, including CEQ's directives and the Clean Air Act (CAA), administered by the U.S. Environmental Protection Agency (U.S. EPA). Because the CEQ NEPA Regulations require NEPA documents to discuss possible conflicts with "State and local…land use plans, policies, and controls for the area concerned," local air quality planning by the California Air Resources Board (CARB) and the Bay Area Air Quality Management District (BAAQMD) was also considered.

Criteria Pollutants

The U.S. EPA is responsible for enforcing the CAA and the National Ambient Air Quality Standards (NAAQS). The NAAQS identify levels of air quality for seven pollutants that are the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect the public health and welfare. The seven criteria pollutants are listed in **subsection 4.2.7**.

Based on monitoring data collected in the air basin, the San Francisco Bay Area Air Basin (SFBAAB) is currently classified by the U.S. EPA as a nonattainment/marginal area for the 8-hour O_3 standard. The SFBAAB was recently designated non-attainment for the new federal $PM_{2.5}$ standard. For all other federal standards, the SFBAAB is in attainment or unclassified.

In response to its enforcement responsibilities, the U.S. EPA requires each state to prepare and submit a State Implementation Plan (SIP) describing how the state will achieve the Federal standards by specified dates, depending on the severity of the air quality within the state or air basin.

General Conformity

The U.S. EPA adopted the General Conformity Rule in November 1993 to implement the conformity provision of Title I, Section 176 (c)(1) of the Federal CAA. This provision requires that the federal government not engage, support, or provide financial assistance to licensing, permitting, or approving any activity not conforming to an approved SIP. To determine whether a federal action would conform or conflict with an approved SIP, a conformity review is performed. The review process comprises the following four steps:

1. Determine whether the proposed action causes emissions of criteria air pollutants.

2. Determine whether the emissions of a criteria pollutant or its precursor would occur in a non-attainment or maintenance area for that criteria pollutant.

3. Determine whether the federal action is exempt from the conformity requirement as per 40 CFR 93.153 (c)(2)-(e).

4. Estimate emissions and compare to the threshold emissions rate and the nonattainment or maintenance area's emissions inventory.

The de minimis levels for a conformity analysis vary based on the attainment status of each criteria pollutant in the air basin, as shown in **Table 5.0-1, General Conformity De Minimis Levels**, below. Because the SFBAAB is a non-attainment/marginal area for the 8-hour O_3 standard and has been designated non-attainment for the new federal $PM_{2.5}$ standard, a general conformity analysis is required for the Proposed Action. As such, the estimated emissions for the Proposed Action and alternatives must be compared with the de minimis levels set forth in 40 CFR 93.153 (b)(1) and (2). If the emissions are greater than or equal to the de minimis levels, a conformity determination must be performed. The purpose of the conformity determination, if needed, is to show if a proposed action conforms to the applicable SIP.

Table 5.0-1
General Conformity De Minimis Levels

Pollutant	Area Designation Type	De Minimis Levels (Tons/Year)
Ozone	Serious non-attainment	50
(ROG or NOx)	Severe non-attainment	25
	Extreme non-attainment	10
	Other areas outside an ozone transport region	**100**
Ozone	Marginal and moderate non-attainment inside an ozone transport region	100
(NOx)	Maintenance	100
Ozone	Marginal and moderate non-attainment inside an ozone transport region	50
(ROG)	Maintenance within an ozone transport region	50
	Maintenance outside an ozone transport region	100
CO, SO2, and NO2	**All non-attainment and maintenance**	**100**
PM_{10}	Serious non-attainment	70
	Moderate non-attainment and maintenance	100
$PM_{2.5}$	**Non-attainment**	**
Lead (Pb)	All non-attainment and maintenance	25

Note: Bold indicates status of SFBAAB relative to attainment and relevant de minimis levels.
*** The U.S. EPA has not established a general conformity de minimis level for $PM_{2.5}$.*
Source: U.S. EPA, "De Minimis Levels," http://www.epa.gov/air/genconform/deminimis.html

BAAQMD CEQA thresholds are presented in **Appendix 3** for reference.

Construction

Fugitive Dust

Construction activities associated with the CRT facility would generate fugitive dust emissions from site grading, building construction, hauling of equipment, hauling soil to and from the site, and construction worker commuting. These emissions would be temporary and would be further reduced by LBNL SPF AQ-1a, which is included in the Proposed Action and would require basic, enhanced, and optional control measures to minimize the generation of fugitive dust. This measure would reduce the fugitive dust emissions to acceptable levels.

Criteria Pollutants

In addition, construction activities for the CRT facility would generate criteria pollutants (ROG, NO_X, PM_{10}, $PM_{2.5}$, CO, and SO_2). These pollutants were calculated using the URBEMIS2007 Environmental Management Software, in accordance with emission factors and parameters recommended by the BAAQMD and compared against general conformity de minimis levels for emissions of criteria pollutants. Modeling results in pounds per day are shown in Table A-3, Estimated Proposed Action Construction Emissions**,** in **Appendix 3**. Emissions would not exceed de minimis levels for any of the criteria pollutants. LBNL SPF AQ-1b to minimize the generation of exhaust emissions during construction is included in the Proposed Action and would be implemented during the construction of the proposed facility. This would ensure that emissions of ozone precursors are minimized during construction. Construction activities would also comply with BAAQMD Regulation 8, Rules 3 and 15, related to architectural coatings and emulsified and liquid asphalt (LBNL 2008). Construction emissions of criteria pollutants would also be below BAAQMD CEQA thresholds of significance.

Carbon Monoxide

CO is produced in greatest quantities from vehicle combustion and is usually concentrated at or near ground level under cool, stable (i.e., low or no wind) atmospheric conditions because it does not readily disperse into the atmosphere. As a result, potential air quality impacts to sensitive receptors are assessed through an analysis of localized CO concentrations. The BAAQMD guidance has a screening procedure for CO hotspots. If the project meets the following criteria, it is not likely to result in CO hotspots:

1. Project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.

2. The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.

3. The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

The CRT facility would meet all of the above criteria. Therefore, the traffic generated by the Proposed Action would not result in substantial CO concentrations or cause a CO hotspot.

Toxic Air Contaminants

As the U.S. EPA has not established a numerical value for de minimis levels for $PM_{2.5}$, BAAQMD CEQA thresholds have been used instead to evaluate effects from emissions of $PM_{2.5}$. The BAAQMD has established a concentration-based threshold for exhaust emissions of $PM_{2.5}$ during construction. Diesel particulate matter (DPM) is primarily emitted as $PM_{2.5}$. The $PM_{2.5}$ concentrations and associated $PM_{2.5}$ and LECR are calculated for emissions from both on-site, off-road construction equipment, and off-site, on-road construction truck traffic. As shown in Table A-4, Modeled $PM_{2.5}$ Concentrations (Construction), in **Appendix 3,** concentrations of $PM_{2.5}$, and the resulting cancer risk and chronic health hazard would be much lower than the BAAQMD thresholds.

Operation

Operational emissions associated with the day-to-day activities of the proposed facility would result from increased vehicular trips to and from the CRT facility site (i.e., mobile sources). Area source emissions associated with the CRT facility would include the use of natural gas for water and space heating and landscape maintenance equipment. Stationary source emissions would include a small boiler, five cooling towers, and two emergency generators (750-kilowatt [kW] each).

Criteria Pollutants

Emissions of criteria pollutants from mobile and area sources were calculated using the URBEMIS2007 Environmental Management Software, in accordance with emission factors and parameters recommended by the BAAQMD. Stationary source emissions were calculated using emission standards from the CARB and the U.S. EPA. Detailed methodology is presented in **Appendix 3**. The results are provided in Table A-5, in **Appendix 3**. Operational emissions associated with the day-to-day activities of the proposed CRT facility would not exceed de minimis levels for ROG, CO, NO_X, SO_x, or PM_{10}. $PM_{2.5}$ emissions would not exceed BAAQMD CEQA thresholds of significance. Projects that generate emissions below de minimis levels would not be considered to contribute a substantial amount of air pollutants to the SFBAAB or contribute substantially to the nonattainment status of the air basin.

Toxic Air Contaminants

The BAAQMD has established a concentration-based threshold for exhaust emissions of $PM_{2.5}$ during project operation. The $PM_{2.5}$ concentrations were calculated for stationary source emissions and area source emissions. As shown in Table A-6, Modeled $PM_{2.5}$ Concentrations (Operational), in **Appendix 3,** concentrations of $PM_{2.5}$ would be much lower than the BAAQMD thresholds and the effects to sensitive receptors (e.g., residences) from DPM during operation would be insubstantial. Under the Proposed Action, there would be two 750-kW diesel emergency generators. The human health hazards from toxic air contaminants (TACs) associated with the proposed CRT facility, including DPM from emergency generator maintenance testing, are presented in Table A-7, Summary of Maximum Modeled Cancer Risks, in **Appendix 3**. As shown in the table, the maximum on-site and off-site cancer risks resulting from the proposed project's TAC emissions would be less than the BAAQMD significance threshold of 10 in 1 million (10×10^{-6}).

In addition to the potential cancer risk, exposure to TACs can result in acute (i.e., short-term) and chronic (i.e., long-term) noncancer health impacts. The chronic noncancer hazard quotients for the Proposed Action were calculated by dividing the maximum annual average concentration of the DPM by the chronic noncancer reference exposure levels. Table A-8, Summary of Maximum Modeled Chronic Noncancer Health Impacts, in **Appendix 3,** shows the maximum chronic hazard indices due to TAC emissions from the CRT facility at on-site and off-site receptors would be less than the BAAQMD significance threshold of 1.0.

5.7.2 Alternative 1, Cafeteria Parking Lot Site

This alternative would be located at the LBNL site. The same air quality effects would apply to the site as described above for the Proposed Action. Construction of Alternative 1 would include an additional subphase involving demolition of the parking lot at the site as compared to the Proposed Action. As shown in Table A-9, Estimated Construction Emissions – Alternative 1, in **Appendix 3,** construction emissions would not exceed de minimis levels or BAAQMD significance thresholds for any of these criteria pollutants during any of the construction phases. The construction $PM_{2.5}$ emissions of Alternative 1 would be lower than the Proposed Action's because less cut and fill are involved at this site; and since the Proposed Action's cancer risk and chronic hazard index are much lower than the BAAQMD thresholds as shown in Table A-4 in **Appendix 3**, the $PM_{2.5}$ emissions from Alternative 1 would not exceed BAAQMD's thresholds for cancer risk and chronic health hazards.

Operation of the CRT facility at the Alternative 1 site would involve the same stationary sources, including the cooling towers and emergency generators, as the Proposed Action. The number of persons that would relocate to LBNL under this alternative would be the same as that of the Proposed Action; therefore, there would be no change in the mobile source emissions. As shown in Table A-10, Estimated Operational Emissions – Alternative 1, in **Appendix 3**, operational emissions of Alternative 1 are below both de minimis levels and BAAQMD significance thresholds. Similar to the Proposed Action, Alternative 1 would meet all of the criteria for CO hotspot assessment and would not result in a CO hotspot.

The Proposed Action and Alternative 1 result in the same operational $PM_{2.5}$ emissions, and as shown in Table A-6 in **Appendix 3**, concentrations of $PM_{2.5}$ would be much lower than the BAAQMD threshold for sensitive receptors (e.g., residences) from $PM_{2.5}$ during operation. In addition, the cancer risk and chronic noncancer health impacts associated with Alternative 1 would be similar to the Proposed Action and below the BAAQMD significance thresholds. As shown in Table A-7 and Table A-8, the Proposed Action's cancer risk is lower than the BAAQMD significance threshold of 10×10^{-6} and the chronic noncancer health impact is much less than the BAAQMD significance threshold of 1.0.

5.7.3 Alternative 2, RFS Site

Under Alternative 2, construction of the CRT facility would occur at the RFS site. Emissions from construction traffic and construction equipment would be similar to the Proposed Action because construction activities would be generally comparable. As shown in Table A-11, Estimated Construction Emissions – Alternative 2 in **Appendix 3**, calculations show that emissions would not exceed de minimis levels or BAAQMD significance thresholds for any of these criteria pollutants during any of the construction phases. The construction $PM_{2.5}$ emissions of Alternative 2 would be lower than the Proposed Action's because less cut and fill would be involved at this site; and since the Proposed Action's cancer risk and chronic hazard index are much lower than the BAAQMD thresholds as shown in Table A-4, **Appendix 3**, the $PM_{2.5}$ emissions from Alternative 2 would not exceed BAAQMD's thresholds for cancer risk and chronic health hazards.

Operation of the CRT facility at the RFS site would involve the same stationary sources, including the cooling towers and emergency generators, as the Proposed Action. However, under Alternative 2, mobile source emissions would likely increase because the number of vehicles traveling to the site would increase. Therefore, the overall operational emissions related to the operation of the CRT facility at the Alternative 2 site would be slightly higher. As calculated in Table A-12, Estimated Operational Emissions – Alternative 2, in **Appendix 3,** operational emissions of Alternative 2 are below both de minimis levels and BAAQMD significance thresholds. Similar to the Proposed Action, Alternative 2 would meet all of the criteria for CO hotspot assessment and would not result in a CO hotspot.

The $PM_{2.5}$ concentrations are calculated for stationary source emissions and area source emissions from project operations. The Proposed Action and Alternative 2 result in the same stationary and area source operational $PM_{2.5}$ emissions, and as shown in Table A-6, Modeled $PM_{2.5}$ Concentrations (Operational), in **Appendix 3,** concentrations of $PM_{2.5}$ would be much lower than the BAAQMD thresholds for sensitive receptors (e.g., residences) from DPM during operation. In addition, the cancer risk and chronic noncancer health impacts associated with Alternative 2 would be similar to the Proposed Action and below BAAQMD significance thresholds. As seen in Table A-7, Summary of Maximum Modeled Cancer Risks and Table A-8, Summary of Maximum Modeled Chronic Noncancer Health Impacts, in **Appendix 3,** the Proposed Action's cancer risk is less than the BAAQMD significance threshold of 10×10^{-6} and the chronic noncancer health impact is much less than the BAAQMD significance threshold of 1.0.

5.7.4 Alternative 3, Former DHS Site

Under Alternative 3, construction of the CRT facility would occur at the former DHS site. Emissions from construction traffic and construction equipment would generally be similar to the Proposed Action because construction activities would be comparable. As shown in Table A-13, Estimated Construction Emissions – Alternative 3, in **Appendix 3,** emissions would not exceed de minimis levels or BAAQMD significance thresholds for any of these criteria pollutants during any of the construction phases. The construction $PM_{2.5}$ emissions of Alternative 3 would be lower than the Proposed Action's; and since the Proposed Action's cancer risk and chronic hazard index are much lower than the BAAQMD thresholds, as shown in Table A-4 in **Appendix 3**, the $PM_{2.5}$ emissions from Alternative 3 would not exceed BAAQMD thresholds.

Operation of the CRT facility at this site would involve the same stationary sources, including the cooling towers and emergency generators, as the Proposed Action. The total number of vehicle trips generated under Alternative 3 would be greater than the Proposed Action because 300 new people would commute to this location, instead of the 135 people under the Proposed Action. Due to availability of transit service to the site and proximity to the Bay Area Rapid Transit (BART) station, 40 percent of the 300 people are assumed to use alternative transportation. The net result would be that an estimated 180 persons would drive to this location. Therefore, operational emissions of criteria pollutants under Alternative 3 would be higher than those estimated for the Proposed Action. However, as shown in Table A-14, Estimated Operational Emissions – Alternative 3, **Appendix 3,** operational emissions of Alternative 3 are below both de minimis levels and BAAQMD significance thresholds. Similar to the Proposed Action, Alternative 3 would meet all of the criteria for CO hotspot assessment and would not result in a CO hotspot.

The $PM_{2.5}$ concentrations are calculated for stationary source emissions and area source emissions. The Proposed Action and Alternative 3 result in the same stationary and area source operational $PM_{2.5}$ emissions, and as shown in Table A-6 in **Appendix 3**, concentrations of $PM_{2.5}$ would be much lower than the BAAQMD thresholds and the potential adverse effects to sensitive receptors (e.g., residences) from DPM during operation would be insubstantial. In addition, the cancer risk and chronic noncancer health impacts associated with Alternative 3 would be similar to the Proposed Action and below BAAQMD significance thresholds. As seen in Table 5.0-7 and Table A-8 in **Appendix 3**, the Proposed Action's cancer risk is less than the BAAQMD significance threshold of 10×10^{-6} and the chronic noncancer health impact is much less than the BAAQMD significance threshold of 1.0.

5.7.5 Alternative 4, Leased Facility on San Pablo Avenue

Under Alternative 4, construction activities would be limited to the construction of an additional floor, interior modifications, and installation of cooling equipment. Given that the extent of construction would be less under this alternative, the emissions related to construction would be proportionally lower. As shown in Table A-15, Estimated Construction Emissions – Alternative 4, in **Appendix 3,** calculations indicate that emissions would not exceed de minimis levels or BAAQMD significance thresholds for any of these criteria pollutants. The construction $PM_{2.5}$ emissions of Alternative 4 are lower than the Proposed Action's; and since the Proposed Action's cancer risk and chronic hazard index are much lower than the BAAQMD thresholds, as shown in Table A-4**,** in **Appendix 3**, the $PM_{2.5}$ emissions from Alternative 4 would not exceed BAAQMD thresholds.

Operation of the facility at the Alternative 4 site would involve similar stationary sources to the Proposed Action and emissions from stationary sources would likely be similar. The total number of vehicle trips generated under Alternative 4 would be greater than the Proposed Action because 300 new people would commute to this location, instead of the 135 new persons that would commute to the LBNL site under the Proposed Action. Due to availability of transit and shuttle services to the site, 20 percent of the 300 persons are assumed to use alternative modes of transportation. The net result would be that an estimated 240 persons would drive to this location. Operational emissions of criteria pollutants under Alternative 4 would therefore be higher than those estimated for the Proposed Action. However, as calculated in Table A-16, Estimated Operational Emissions – Alternative 4, in **Appendix 3**, operational emissions of Alternative 4 are below both de minimis levels and BAAQMD significance thresholds. Similar to the Proposed Action, Alternative 4 would meet all of the criteria for CO hotspot assessment and would not result in a CO hotspot.

The $PM_{2.5}$ concentrations are calculated for stationary source emissions and area source emissions from project operation. The Proposed Action and Alternative 4 result in the same stationary and area source operational $PM_{2.5}$ emissions, and as shown in Table A-6 in Appendix 3, concentrations of $PM_{2.5}$ would be much lower than the BAAQMD thresholds. In addition, the cancer risk and chronic noncancer health impacts associated with Alternative 4 would be similar to the Proposed Action and below BAAQMD significance thresholds. As seen in Table A-7 and Table A-8 in Appendix 3, the Proposed Action's cancer risk is less than the BAAQMD significance threshold of 10×10^{-6} and the chronic noncancer health impact is much less than the BAAQMD significance threshold of 1.0.

5.7.6 Alternative 5, No Action

Under Alternative 5, no new building space would be constructed; therefore, the No Action alternative would not result in any additional air pollutants compared to existing conditions. The existing operational emissions from the OSF would continue. As calculated in Table A-17, Estimated Operational Emissions – Alternative 5, **Appendix 3**, existing operational emissions for Alternative 5 are below both de minimis levels and the BAAQMD significance thresholds. Alternative 5 would not result in increases of impacts associated with $PM_{2.5}$, CO hotspots, cancer risk, and chronic health risks.

5.8 GREENHOUSE GASES

As stated in **subsection 4.2.8**, increased concentrations of greenhouse gases (GHGs) in the atmosphere due to human activities and the associated changes in global climate represent potential adverse environmental effects. The Proposed Action and alternatives are evaluated below for their potential to generate GHGs and potentially contribute to global climate change.

The appropriate approach to evaluating a project's potential impact on global climate under NEPA is still under development. The Council on Environmental Quality (CEQ), the agency responsible for administering NEPA, has released draft NEPA guidance on greenhouse gas emissions. The guidance recommends a threshold of 25,000 CO_2-equivalent metric tons ($MTCO_2e$)[4] of direct emissions as a threshold for analysis within NEPA documents. The guidance suggests that emissions below this threshold would not be relevant to and would not need to be discussed within a NEPA analysis. The draft NEPA guidance focuses on direct emissions only (GHG emissions that would be generated on site by the project) and does not include off-site indirect emissions such as those generated by vehicle trips to and from the project site or from the generation of electricity used by the proposed project.

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4 The CO_2 equivalent emissions are commonly expressed as "metric tons of carbon dioxide equivalent ($MTCO_2e$)." The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated global warming potential (GWP), such that $MTCO_2E$ = (metric tons of a GHG) x (GWP of the GHG). For example, the GWP for methane is 21. This means that emissions of one metric ton of methane are equivalent to emissions of 21 metric tons of CO_2.

Although the CARB has not yet put forth significance thresholds for use to evaluate projects in California, CARB has implemented a mandatory GHG reporting program that requires large industrial GHG emitters to report their GHG emissions. Large stationary combustion facilities that emit greater than or equal to 25,000 $MTCO_2$ per year are subject to the reporting requirements. While CARB's reporting program and the CEQ's draft NEPA guidance do not provide significance thresholds, the 25,000 $MTCO_2e$ reporting threshold can be seen as a dividing line for major GHG emitters, which could have the potential to result in an adverse impact on the environment.

In June 2010, the BAAQMD issued guidance for evaluating the climate change impact of land development projects in the Bay Area and stationary source projects subject to BAAQMD permitting authority. The BAAQMD guidance does not require quantification of a project's construction-phase GHG emissions nor does the guidance include a significance threshold for evaluating the impact of construction-phase emissions. The BAAQMD guidance includes quantitative thresholds of significance for operational impacts that were developed based on a consideration of certain categories of future projects in the Bay Area. The Proposed Action is not within the categories of projects considered by the BAAQMD. More importantly, the new thresholds do not apply to this project, as BAAQMD directed lead agencies to apply the new thresholds only to projects for which a Notice of Preparation is published and for which environmental analysis commences on or after June 2, 2010 (see Bay Area Air Quality Management District, Resolution No. 2010-06). The environmental review for the CRT project under CEQA began in 2007 and was completed in 2008, and the NEPA review was commenced in October 2009. Furthermore, the EA is a NEPA document, which utilizes federal thresholds where available.

5.8.1 Proposed Action

The construction and operation of the CRT facility would generate GHG emissions, which would contribute to potential cumulative impacts on global climate.

Construction Phase GHG Emissions

GHG emissions from construction activities would occur from internal combustion engine exhaust associated with off-road construction equipment, exhaust from on-road trucks associated with the CRT facility, and construction worker commute vehicle travel. GHG emissions were estimated using the same methods and models used to calculate criteria pollutant emissions presented in **Section 5.7**. **Table 5.0-2, Estimated Construction GHG Emissions**, shows a summary of the total estimated GHG emissions from the construction of the Proposed Action.

Table 5.0-2
Estimated Construction GHG Emissions

GHG Emissions Source	Emissions (Metric Tons CO_2e/year)
Period 1 (10/01/2010 - 12/31/2010): Grading/Trenching	138.91
Period 2 (2011): Building Construction	232.42
Period 3 (2012): Building Construction	233.38
Period 4 (1/1/2013 - 6/30/2013): Building/Coating/Paving	161.83
NEPA Threshold	None

Source: Impact Sciences, Inc.

Operation-Phase GHG Emissions

Operation of the CRT facility would generate GHG emissions from a number of sources that include (1) area sources (natural gas consumption), (2) motor vehicles, (3) indirect sources (electricity consumption, water, and wastewater), and (4) stationary sources (a boiler and two emergency generators).

Table 5.0-3, Estimated Operational GHG Emissions (Direct and Indirect Sources) shows a summary of the total estimated GHG emissions from operation of the Proposed Action. The Proposed Action's direct (Scope 1) emissions[5] of 635 $MTCO_2e$ would not exceed the threshold of 25,000 $MTCO_2e$ proposed by the CEQ. As noted earlier, the CEQ has not proposed this threshold to evaluate whether the impact of a project would be substantial; the proposed threshold suggests that a project that generates emissions below this number does not represent a major emitter of GHGs. The Proposed Action would therefore not be considered a major emitter of GHGs.

Although current NEPA guidance does not require consideration of a project's indirect emissions (Scope 2 and 3 emissions) for completeness **Table 5.0-3** presents these emissions as well. The table also presents the emissions associated with the operation of NERSC at OSF. Because the Proposed Action would replace the operations at OSF, these emissions were subtracted to obtain net new emissions. As the table shows, the Proposed Action's net total emissions (12,474 $MTCO_2e$) would also not exceed the CEQ threshold of 25,000 $MTCO_2e$.

5 Scope 1 emissions include direct emissions from area and stationary combustion sources, and fugitive emissions (e.g., refrigerant loses, research gases, fume hood testing, electrical switches, fire extinguishers, and distribution losses in natural gas lines). Scope 2 emissions include indirect emissions related to the production and consumption of electricity; and Scope 3 emissions include all other indirect emissions from commuting, air travel. Construction emissions may also be included as Scope 3.

Table 5.0-3
Estimated Operational GHG Emissions (Direct and Indirect Sources)

GHG Emissions Source	Emissions ($MTCO_2e$/year)	CEQ Threshold ($MTCO_2e$/year)
Direct Sources		
Stationary Sources	467	
Area Sources	168	
Total Direct	**635**	**25,000**
Indirect Sources		
Mobile Sources	435	
Electricity Consumption*	34,711	
Water Supply	1	
Wastewater Treatment	< 1	
Total Indirect	**35,147**	**None**
Grand Total	35,782	
Less Existing Emissions at OSF	23,309	
Net New Emissions	**12,473**	**None**

** The GHG emissions calculation is based on the average of the various generation sources for the electricity supplied through the Northern California DOE Laboratory Electric Power Purchasing Consortium.*

The CRT building at the LBNL site would receive electricity from the Western Area Power Administration (WAPA). WAPA delivers electricity that is approximately 20 percent supplied from hydropower. For this reason, the estimated total GHG emissions from electricity consumptions reported above were calculated using the assumption that 20 percent of electricity would be from hydroelectric sources and the remainder would be from a mix of electricity sources.

Furthermore, the CRT facility incorporates features that would substantially lessen its contribution to GHG emissions and global climate change. The UC Policy on Sustainable Practices provides emission-reduction strategies, including practices related to green building design, clean energy, climate protection, transportation, operations, recycling and waste management, and environmentally preferable procurement. In compliance with UC Policy, the Proposed Action incorporates numerous design features that are also consistent with AB 32 goals and strategies and with the mitigation measures in the BAAQMD guidelines. These features reduce the Proposed Action's GHG emissions by substantially more than 29 percent compared to business-as-usual (BAU) emissions (BAU is generally defined as development without any measures to reduce greenhouse gas emissions). The project has been designed to meet LEED Gold standards, which means among other things that the project's electricity consumption would be more than 30 percent better than the state's energy efficiency standards for residential and nonresidential buildings established under Title 24, Part 6 of the California Code of Regulations. The project includes numerous measures to minimize electricity use, including a cool roof, natural ventilation, daylighting, use of high performance computer exhaust heat to warm up the office space, etc. In order to achieve green building principles and to be consistent with the 2006 LRDP, the design of the proposed facility would integrate the building into the hillside. High performance glazing and shading would be used to reduce the effects of afternoon heat gains. The exterior of the HPC portion of the building would be primarily of metal with minimal fenestration to reduce temperature changes to the interior. The facility also includes high-efficiency evaporative cooling towers, high-efficiency fixtures, waterless urinals, and rain harvesting, all of which would reduce water demand and GHG emissions from use of electricity associated with water supply. The CRT facility would also include parking for approximately 30 bicycles and would not provide general use parking spaces with the purpose of discouraging single occupant vehicle trips. The Proposed Action includes showers for bike users, transit service, and a TDM program. The Proposed Action also includes roof and non-roof paving materials that are designed to reduce the facility's heat island effect and waste reduction measures, including use of recycled materials. The CRT HPC has been designed with a power usage efficiency that is better than any data center benchmarked to date. The office component as designed would achieve 47 percent electricity savings when compared to the baseline-building model. In addition, UC LBNL is in the process of developing a climate action plan (CAP). Once the plan is developed, all facilities (including the proposed CRT facility) and LBNL operations would be required to comply with the CAP to reduce GHG emissions. The UC operates and maintains LBNL under contract with the DOE. The DOE operating contract requires submittal of a Site Sustainability Plan (SSP), which addresses the same elements as a UC Climate Action Plan (CAP). LBNL submitted the FY 2011 SSP in December 2010. All LBNL facilities (including the proposed CRT facility) and other LBNL operations are required to comply with the SSP to reduce GHG emissions.

The Proposed Action would include the removal of trees, largely consisting of non-native trees, as discussed in **Section 3.0.** This removal of trees, and vegetation removal associated with the near-term cumulative projects, would result in the loss of some carbon sequestration. The Proposed Action includes, however, replacement plantings of native plant species to replace the removed trees at a 1:1 ratio, and this replacement planting would substantially lessen the project's contribution to any cumulative impact on carbon sequestration.

5.8.2 Alternative 1, Cafeteria Parking Lot Site

This alternative would also be located at the LBNL site and would be essentially identical to the Proposed Action in terms of its size, construction, and operation. The environmental effects described above for the

Proposed Action would also apply to this alternative. **Table 5.0-4, Summary of Maximum Estimated Emissions,** reports the GHG emissions from this alternative.

5.8.3 Alternative 2, RFS Site

Under Alternative 2, construction of the CRT facility would occur at the RFS site. GHG emissions from construction would be similar to the Proposed Action because construction activities would be generally comparable. Under Alternative 2, mobile source emissions would likely increase because the number of vehicles traveling to the site would increase. In addition, emissions associated with electricity use would be higher. Therefore, the GHG emissions related to the operation of the CRT facility at the Alternative 2 site would be higher compared to the Proposed Action. **Table 5.0-4** reports the GHG emissions from this alternative.

5.8.4 Alternative 3, Former DHS Site

Under Alternative 3, construction of the CRT facility would occur at the former DHS site. GHG emissions related to construction would be similar to the Proposed Action because construction activities would be comparable. In addition, operation of the CRT facility would involve the same stationary sources, including the cooling towers and emergency generators, as the Proposed Action. As explained in **subsection 5.7.4** under Alternative 3, the total number of vehicle trips generated would be greater than the Proposed Action and an estimated 180 persons would drive to this location. Mobile source emissions from this alternative would increase because the number of vehicles traveling to the site would increase. In addition, emissions associated with electricity use would be higher. GHG emissions related to the operation of the CRT facility at the Alternative 3 site would be higher than the Proposed Action GHG emissions. **Table 5.0-3** reports the GHG emissions from this alternative.

Table 5.0-4
Summary of Maximum Estimated Emissions (in $MTCO_{2e}$ per year)

	$MTCO_{2e}$ per year					
Emission Source	Proposed Action	Alternative 1 Cafeteria Parking Lot Site	Alternative 2 RFS Site	Alternative 3 Former DHS Site (40% trip reduction)	Alternative 4 Leased Facility on San Pablo Avenue (20% trip reduction)	Alternative 5 No Action
Construction						
Period 1: Grading/Trenching	139	121	139	139	59	0
Period 2: Building	232	232	232	232	232	0
Period 3: Building	233	233	233	233	233	0
Period 4: Building/Coating/Paving	162	162	162	162	117	0
Operational						
Area Sources	168	168	168	168	168	106
Stationary Sources	467	467	467	467	467	*
Mobile Sources	435	435	968	580	776	226
Indirect Electricity, Water, Wastewater	34,712	34,712	43,376	43,376	43,376	22,977
Total Operational	35,782	35,782	44,978	44,591	44,786	23,309
Net Increase in Emissions Compared to No Action	12,473	12,473	21,669	21,282	21,477	NA

** Stationary source emissions included in Area source emissions.*
Source: Impact Sciences, 2010.

5.8.5 Alternative 4, Leased Facility on San Pablo Avenue

Under Alternative 4, the extent of construction would be less and the GHG emissions related to construction would be proportionally lower. As explained in **subsection 5.7.5**, the total number of vehicle trips generated under Alternative 4 would be greater than the Proposed Action and an estimated 240 persons would drive to this location. Mobile source emissions under Alternative 4 would likely increase because the number of vehicles traveling to the site would be greater. In addition, emissions associated with electricity use would be higher. GHG emissions related to the operation of the CRT facility at the Alternative 4 site would be higher than the Proposed Action GHG emissions. **Table 5.0-3,** reports the GHG emissions from this alternative.

5.8.6 Alternative 5, No Action

The No Action alternative would not result in any additional GHG emissions compared to existing conditions. However, continuing operations of the OSF would generate GHG emissions that are reported in **Table 5.0-3**.

5.9 NOISE

5.9.1 Proposed Action

Construction Noise

Construction activities would temporarily elevate noise levels at the Proposed Action site and in the surrounding areas. The construction noise analysis prepared for the CRT Facility EIR was based on generic construction noise data. Detailed phase-by-phase information was not available for the numbers and types of pieces of equipment expected at the construction site. New information has become available since publication of the CRT Facility EIR. For construction of the facility under the Proposed Action, there is now information on the numbers and types of equipment expected at the construction site during each phase, as well as the number of days that the equipment would be present on the construction site. The analysis of construction noise levels was refined to provide a realistic worst-case assessment, based on this new information (Illingworth & Rodkin 2010a).

Noise levels were calculated at the two noise-receiver locations identified in the EIR as being the most affected receivers: the Foothill Student Housing Complex, which is located about 685 feet west of the project site, and the Nyingma Institute, located about 790 feet west of the project site. The effect of topographical shielding was also evaluated in the refined analysis given that the site is on a hillside over 200 feet above the elevation of the noise-receiver locations and there are intervening undulations in the topography. The shielding analysis indicated that there would be a direct line of sight between the Nyingma Institute and the CRT construction site, so no acoustical shielding was assumed. Acoustical shielding provided by intervening topography would attenuate noise in the direction of the Foothill Student Housing Complex for construction noise sources at or near the ground. Five A-weighted decibels[6] (dB[A]) of noise attenuation was calculated for sources at or near the ground. No attenuation was assumed for sources above the ground, such as the tower crane (Illingworth & Rodkin 2010a).

The results of the refined noise analysis are shown in **Table 5.0-5, Construction Noise Levels**. The table shows noise levels received at a theoretical reference distance of 50 feet from all operating noise sources, at the Foothill Student Housing Complex, and at the Nyingma Institute. The projected noise levels reported in **Table 5.0-5** represent the maximum noise levels expected on a workday when all pieces of equipment anticipated for that construction phase are operating simultaneously. During times of the day or during days when all equipment is not operating, noise levels would be lower than the noise levels presented in **Table 5.0-5**.

Table 5.0-5
Construction Noise Levels

	Received Noise Level (dB(A))		
Construction Phase	**Reference (at 50 ft)**	**Foothill Student Housing**	**Nyingma Institute**
Excavation/Site Work	87	59	63
Foundation	85	58	61
Building Erection	88	61	64
Exterior Finishes	90	62	66

Source: Illingworth & Rodkin, Inc. 2010a

According to the Berkeley Municipal Code (BMC), construction activities lasting more than 10 days shall not produce exterior noise levels in excess of 60 dB(A) on adjacent residential properties zoned R-1 and R-2 during weekdays and in excess of 65 dB(A) during weekdays on adjacent properties zoned R-3 and above multifamily residential. The Nyingma Institute and the Foothill student housing sites are zoned R-3 and R-5 respectively under the City of Berkeley zoning.

6 Noise levels in this analysis are reported as "A-weighted decibels." A-weighting is a method of adjusting decibels to correspond more accurately with the way the human ear hears.

According to the analysis, exterior noise levels during construction would range from 58 to 62 dB(A) at the Foothill Student Housing Complex. Noise from vehicular traffic on Cyclotron Road near Foothill Student Housing was measured at an average typical daytime level of 57 dB(A) and ranges from 55 to 65 dB(A). Therefore, construction noise levels would not substantially exceed existing noise levels at Foothill Student Housing. Furthermore, calculations demonstrate that noise from CRT construction activities will not exceed City of Berkeley Noise Ordinance limits at Foothill Student Housing, which is set at 65 dB(A) for construction noise at multi-family residential developments.

As shown in **Table 5.0-5**, noise levels during construction would range from 61 to 66 dB(A) at the Nyingma Institute depending on the phase of construction occurring at the project site. For most of the construction period, exterior noise levels that would be experienced at the Institute from construction activities at the CRT site would not exceed 65 dB(A), except for intermittent periods during the short duration of exterior finishing activities (4.5 months). This would be when the project's construction noise levels are conservatively calculated to be 66 dB(A) at the Institute if all exterior finishing activities are occurring at the same time. Such calculated noise levels would exceed the maximum noise level for long-term construction noise set by the Berkeley Noise Ordinance for multi-residential developments by 1 dB(A). However, this theoretical 1 dB(A) exceedance would occur only if all equipment used in exterior finishing activities on the CRT façade facing Nyingma Institute are in use at the construction site simultaneously, a scenario that would potentially occur on occasions but not during the entire 4.5 months of exterior finishing activities. Furthermore, the Nyingma Institute adjoins Hearst Avenue and the portions of the building that would be oriented towards the construction site are already exposed to noise from traffic on Hearst Avenue Ambient noise measurements along Hearst Avenue at Highland Place near the Nyingma Institute show an average noise level of 64 dB(A), with noise levels ranging from 57 to 80 dB(A) as vehicle traffic fluctuates. Construction noise levels during finishing activities would not substantially exceed existing hourly average noise levels and would fall within the range of existing traffic noise levels in the area (Illingworth & Rodkin 2010a).

The nearest single-family residences are located more than 1,000 feet to the northwest of the project site. These residences are afforded substantial shielding by topography and Building 88. With noise attenuation due to topographical shielding and the additional distance between the construction site and the single-family residences, construction noise levels of less than 60 dB(A) would be experienced at the nearest single-family residences, below the City of Berkeley maximum allowable receiving noise standard for single family residential uses (Illingworth & Rodkin 2010a).

The effect of the Proposed Action's construction truck traffic in conjunction with other construction truck traffic associated with LBNL and UC Berkeley projects is discussed in **subsection 6.2.9**.

Operational Noise from Project Traffic

Traffic data at five study intersections were used to determine whether or not there would be a substantial increase in traffic noise on streets serving the Proposed Action site as a result of traffic generated by the Proposed Action. Traffic generated by the CRT facility would not result in a noticeable increase in the day/night average noise level (less than 0.5 dB(A) day/night noise [L_{dn}]) along any of the roadway segments, including Hearst Avenue segment adjacent to the Nyingma Institute (LBNL 2008).

Operational Noise from On-Site Equipment

Operation of heating, ventilating, and air conditioning equipment (HVAC) at the Proposed Action site could affect long-term ambient noise levels and potentially affect the nearby off-site receptors—the most affected receivers being the Foothill Student Housing Complex and the Nyingma Institute located west of the project site. BMC Table 13.40-1 presents the maximum exterior noise levels allowable for residential and commercial land uses. The City uses these noise levels to control the maximum noise from the operation of stationary equipment on one property from adversely affecting adjacent properties. According to the BMC, the maximum allowable exterior noise levels from the operation of stationary equipment as received on an adjacent residential property zoned R-1 and R-2 are 55 dB(A) between the hours of 7 AM to 10 PM and 45 dB(A) from 10 PM to 7 AM. For properties zoned R-3 and above, the maximum allowable exterior noise levels are 60 dB(A) between the hours of 7 AM to 10 PM and 55 dB(A) from 10 PM to 7 AM.

Taking into consideration the attenuation due to distance and the shielding provided by the topography in the case of Foothill Student housing and attenuation due to distance and the shielding provided by the CRT building in the case of the Nyingma Institute, the calculated exterior noise levels from the cooling towers are 43 to 44 dB(A) at Foothill Student Housing, the Nyingma Institute and in the surrounding areas, well below the BMC allowable level for R-3 and R-5 zoning. With respect to air handlers associated with the building's HVAC systems, LBNL SPF Noise-4, which is a part of the Proposed Action, requires that noise from stationary sources such as HVAC equipment meet the Berkeley noise ordinance limits. Based on detailed analyses completed by Charles M Salter Associates in July 2010, noise levels from the project air handlers would comply with the Berkeley noise ordinance limits at the Institute and other off-site residential receptors (Illingworth & Rodkin 2010b). Noise levels would be less at all other off-site sensitive receiver locations.

Total Operational Noise

As discussed above, the project's operational traffic would not make an appreciable difference to those existing noise levels – the project's traffic would increase the ambient noise levels by less than 0.5 dB(A).

Also as discussed above, other sources of operational noise associated with the Proposed Action (cooling towers and air handling units) would not add to the noise levels experienced by sensitive receptors, including the Nyingma Institute and Foothill Student Housing, because noise levels generated by the Proposed Action's stationary equipment would meet the City's ordinance requirements at the LBNL property line with the Institute. The operation of the CRT facility would therefore not generate substantial levels of noise at the nearest sensitive receptors.

5.9.2 Alternative 1, Cafeteria Parking Lot Site

Similar to the Proposed Action, the alternative would result in traffic generation that could increase ambient noise levels at intersections. The effects under Alternative 1 would be substantially similar because the population added to the site under Alternative 1 would be the same.

This alternative site is located upslope and to the east of the Proposed Action site and therefore is more than 1,100 feet from the Foothill Student Housing Complex and 1,200 feet from the Nyingma Institute, the two nearest off-site sensitive receptors. Therefore, in comparison to the Proposed Action, noise levels associated with operation and construction of the facility would be reduced because sensitive-receiver locations would be farther away and the noise would be attenuated more.

5.9.3 Alternative 2, RFS Site

Noise levels related to operation and construction of the facility would be the same as described under the Proposed Action. The Alternative 2 site is not located near sensitive receptors. The nearest residential neighborhood is located at least 457 meters (1,500 feet) from the alternative site, and there are several intervening buildings between the site and the homes in this neighborhood and a clear line of sight is not available. Given the intervening buildings and distance to the residences, it is expected that the residential receptors would not be exposed to substantial noise level increases from project construction and operation. The vehicular traffic generated under Alternative 2 would not travel past any homes and therefore would not increase ambient noise levels near sensitive receptors.

5.9.4 Alternative 3, Former DHS Site

In the vicinity of the former DHS site, traffic noise on the street network dominates the noise environment. Along Shattuck Avenue, typical hourly average noise levels range from 68 to 71 dB(A) during the daytime and drop to about 55 dB(A) at night. The measured day/night average noise level on Shattuck Avenue in the Campus Park area was 71 L_{dn}. Short-term measurements made along other streets in the areas adjacent to the Campus Park showed similar noise levels (UC Berkeley 2009).

Construction and operation of the CRT facility under Alternative 3 would generate noise in the vicinity of the former DHS site. Development of the facility would be subject to the mitigation measures prescribed in the UC Berkeley 2020 LRDP EIR that would reduce noise levels associated with facility operation and construction. Mechanical equipment selection and shielding would be utilized to ensure noise levels from operation of the facility do not cause City of Berkeley Noise Ordinance limits to be exceeded in the vicinity. Construction noise-control specifications would include such information as general provisions, definitions, submittal requirements, construction limitations, requirements for noise and vibration monitoring and control plans, noise-control materials and methods (UC Berkeley 2009). However, despite implementation of control measures, the noise generated by construction of the CRT facility at this site would exceed the levels set by the local ordinance at the 1910 Oxford Street apartments, which are on the same city block as the CRT facility.

Because of the site's proximity to transit facilities, this alternative would not result in a substantial increase in vehicle trips. Therefore, the increase in traffic noise due to this alternative would be minimal.

5.9.5 Alternative 4, Leased Facility on San Pablo Avenue

Since construction activities would be limited to the construction of an additional floor, interior modifications, and installation of cooling equipment, the duration of construction under this alternative would be shorter and the exposure to construction noise would be over a shorter period of time in comparison to the Proposed Action. However, the nearest sensitive receptors (residences) are located about 30 meters (82 feet) to the south of the alternative site, and there are no intervening buildings or vegetation to attenuate noise. Therefore, although construction activities under the alternative would be limited, the duration of construction activities would be greater than 10 days and the nearest residences would be exposed to temporary noise levels that would exceed 65 dB(A), which is the maximum allowable receiving noise level for residential uses according to the City of Oakland's noise ordinance. Implementation of LBNL SPFs NOISE-1a and 1b, requiring noise reduction measures during construction, which are voluntarily included in the alternative, would reduce construction noise levels. Construction-period noise controls would reduce the noise levels but would not necessarily bring them below 65 dB(A) at the nearest residential receptor.

Operation of the facility under this alternative would generate noise similar to the operational noise levels described above for the Proposed Action. Mechanical equipment that would be installed at the building site would generate noise. However, standard acoustical shielding and the use of quieter equipment would adequately control operational noise from facility operations. The relocation of staff to the leased facility in Berkeley would result in a small increase in traffic volumes along San Pablo Avenue and other routes accessing the site compared to existing volumes. Because the traffic increase would be small and it takes a doubling of traffic to result in a 3 dB(A) increase in noise, the increase in noise levels would not be perceptible.

5.9.6 Alternative 5, No Action

The No Action alternative would maintain current staff travel patterns and operations at OSF and there would be no change in noise levels at or near the OSF site.

5.10 TRANSPORTATION AND TRAFFIC

5.10.1 Proposed Action

Construction Traffic

Construction of the proposed CRT facility is expected to start in early 2011 and be completed by fall 2013. Construction could result in temporary impacts from truck traffic, material staging, construction worker commute trips, and parking. The 2006 LRDP EIR identified existing construction management "best practices" routinely undertaken at LBNL to limit otherwise potentially adverse construction-related impacts and set these forth as LBNL Best Practices 6a through 6c. The LRDP EIR identified these best practices as continuing best practices required to be incorporated into contract specifications and management oversight for all development projects under the 2006 LRDP. They require construction contractors to meet with UC LBNL and prepare a Construction Traffic Management Plan (CTMP) to lessen the impacts of construction on traffic and parking. The CTMP must propose truck routes, limit truck traffic during peak commute period (7:00 to 9:00 AM and 4:00 to 6:00 PM), and prepare a parking management plan for construction workers. A CTMP would be prepared and implemented during project construction.

Approximately 12,200 cubic yards (cy) of structural fill, which would be hauled to the project site from a storage area on the LBNL site, would be required to construct the CRT facility at the Proposed Action site. Trucks would use existing internal LBNL roadways to transport the fill materials from the storage site. Assuming a truck capacity of 12 cy, there could be up to 1,020 internal truck trips between the storage area and the project site as a result of the transfer of fill.

Off-haul of approximately 15,500 cy of earth materials would be required. Assuming a truck capacity of 12 cy, this would require approximately 1,290 truck trips from the CRT facility site to the freeway, and 1,290 return truck trips. These truck trips would follow the designated truck route (Hearst–Oxford–University Avenue) in the City of Berkeley to and from the LBNL site. In addition to off-haul of earth materials, project construction activities would generate daily construction vehicle trips associated with delivery of construction materials and transport of construction workers to the site. There would be an average of three large delivery truck trips per day, with a peak number of 10 to 15 trips per day, in fall 2011 associated with the delivery of concrete, rebar, form work, structural steel, mechanical and electrical equipment, exterior siding and windows, drywall and studs, pipes and conduits, roofing materials, etc. On an average, there would be 1 to 5 construction worker bus trips (round trips) each day, and there would be from 10 to 50 small truck deliveries to the project site daily during the construction period. Therefore, at peak there could be up to 10 large delivery truck trips, about 50 small delivery truck trips, and 1 to 5 construction worker bus trips to the site in one day.

As explained above, UC LBNL is required to incorporate LBNL Best Practices 6a through 6c into contract specifications and management oversight for all development projects under the 2006 LRDP, thereby minimizing construction traffic impacts on City streets. Pursuant to LRDP Best Practice TRANS-6c, UC LBNL has instituted a program to manage aggregate construction truck trips to avoid exceeding impact thresholds during heavy truck activity periods. As a part of this program, the designated UC LBNL Construction Coordinator oversees each construction project on the LBNL site to keep the total number of one-way truck trips on the Hearst–Oxford–University Avenue truck route below 98 trips per day.[7] Truck trips associated with the Proposed Action would also be subject to this LBNL site program, which is a part of the project and would ensure that the project's construction truck trips when added to truck trips from other ongoing construction projects would not exceed the established limit. Construction worker vehicle trips would be avoided by providing parking at an off-site location and bringing the workers to the site by bus.

Operational Traffic

The Proposed Action would increase the daily population of the LBNL site by 135 employees. These relocating staff would generate new vehicle trips that could affect roadways leading to and from the LBNL site. To evaluate the Proposed Action's effects on the transportation system, based on City of

[7] The LRDP EIR, under Impact TRANS-6 (focused on construction traffic), concluded that estimated construction truck traffic from the LBNL site including 65 one-way daily truck trips (33 trucks per day) in a peak year would not result in a significant impact to city intersections. Since the certification of the 2006 LRDP EIR, in anticipation of concurrent construction of a number of large projects on the LBNL site, UC LBNL conducted a reevaluation of the traffic impacts associated with construction truck trips. This study, conducted by Fehr & Peers, examined the existing (2009) traffic conditions along the designated truck route from the LBNL site through the City of Berkeley to I-80, focusing on major intersections that are known to be operating at or near failing conditions. The study determined that so long as the total number of one-way truck trips from the LBNL site that pass through the Hearst Avenue, Oxford Street, and University Avenue intersections do not exceed 98 one-way truck trips per day (or 49 trucks per day) and LBNL's construction truck traffic does not exceed 50 one-way truck trips (or 25 trucks a day) through the Gayley Road/Stadium Rim Way intersection, construction traffic will result in minimal effects on city intersections, based on the City of Berkeley standards of significance. The study utilized the City's thresholds of significance that were amended in late 2007.

Berkeley standards, the following thresholds of significance were used. For signalized and all-way-stop intersections, traffic impacts were considered significant if the Proposed Action caused:

- intersection operations to degrade from Level of Service (LOS) D to LOS E or worse and there is more than a 2-second increase in delay; or
- more than a 3-second increase in delay at intersections operating at LOS E without and with the project; or
- intersection operations to degrade from LOS E to LOS F and there is more than a 3-second increase in delay; or
- at intersections operating at LOS F without the project, the volume-to-capacity ratio to change by more than 0.01.

For side-street stop-controlled intersections, the traffic impacts were considered significant if:

- the project caused the critical approach to operate at LOS F,
- the intersection meets peak hour signal warrants; and
- no alternative routes are available.

Trip Generation

Vehicle trips for the CRT facility under the Proposed Action were estimated based on trip generation rates established in the LBNL 2006 LRDP EIR, which assumed that vehicle trips generated by the growth under the 2006 LRDP would be proportional to the estimated population increase. The approximately 4,000 employees at the LBNL site currently generate 5,700 daily trips, 610 AM peak hour trips, and 660 PM peak hour trips (LBNL 2007). Based on the existing rates, the 135 additional employees under the Proposed Action would generate 192 new daily trips, 21 new AM peak hour trips, and 22 new PM peak hour trips.

Traffic Impacts

The CRT facility under the Proposed Action would be constructed and operational by 2013. Other reasonably foreseeable projects at the LBNL site listed in **Section 6.0, Cumulative Effects**, would be constructed concurrently and completed by 2018. Therefore, the effects of the project's operational traffic were evaluated at the four study intersections under 2018 conditions with and without the project. Major projects completed after collection of existing condition data, currently under construction, or expected to be completed by 2018 would add to the traffic in the study area. These projects included in this analysis are described below:

- Underhill Parking Structure, recently completed by UC Berkeley, provides 690 net new parking spaces in the Southside area.

- Lower Hearst Parking Structure, recently completed by UC Berkeley, provides 100 net new parking spaces in the Northside area.
- Southeast Campus Integrated Projects (SCIP) would consolidate existing parking spaces and provide 300 additional parking spaces in the southeast area of the UC Berkeley campus. About 546 parking spaces would be provided at the Maxwell Family Field Parking Structure, located at Stadium Rim Way just east of Gayley Road.
- Solar Energy Research Center (SERC) Project, located near the center of the LBNL site, would increase LBNL population by about 50 persons.
- BELLA and the Guest House projects would add up to 20 employees at the LBNL site.
- User Test Bed Facility Project would increase the LBNL site population by no more than 10 persons.

Other planned LBNL projects, including Seismic Phase 1, Seismic Phase 2, Seismic Phase 3, User Support Building, and Old Town demolition would not add any new population to the LBNL site and therefore generate no new trips. New trips generated by other UC Berkeley projects such as the Northeast Quadrant Science and Safety projects (NEQSS), Law School Infill, Naval Architecture Restoration and Blum Center, and Warren Hall replacement are included in the trips associated with the parking structure projects.

Study intersections and existing peak hour traffic volumes are shown on **Figure 5.0-2, Study Intersection Locations, Lane Configurations, and Traffic Control** and **Figure 5.0-3, Existing Peak Hour Traffic Volumes**. Estimated traffic generated by the near-term projects was added to the existing conditions volumes to estimate intersection volumes under Near-Term No CRT and is shown on **Figure 5.0-4, Near-Term No CRT Conditions – Peak Hour Traffic Volumes**. Vehicle trips generated by the CRT facility were added to the Near-Term No CRT traffic volumes to estimate Near-Term With CRT volumes and are shown on **Figure 5.0-5, Near-Term with CRT Conditions – Peak Hour Traffic Volume**. Delay and LOS results for AM and PM peak hours under the Near-Term No Project and With Project conditions are presented in **Table 5.0-6, 2018 Conditions – Study Intersection LOS Summary**. As the results show, the traffic associated with the CRT facility would not cause an exceedance of the significance thresholds for traffic impacts established by the City of Berkeley.

Table 5.0-6
2018 Conditions – Study Intersection LOS Summary

Intersection	Control	Peak Hour	Near-Term No Project Delay (Seconds)[1]	Near-Term No Project LOS[1]	Near-Term With Project Delay (Seconds)[1]	Near-Term With Project LOS[1]
Hearst Avenue/Gayley Road/La Loma Avenue	Signalized	AM	33	C	35	D
		PM	**57**	**E**	**57**	**E**
Stadium Rim Way/ Gayley Road	All-Way Stop-Controlled	AM	**49**	**E**	**50**	**E**
		PM	**>60 (v/c = 1.15)**	**F**	**>60 (v/c = 1.16)**	**F**
Bancroft Way/ Piedmont Avenue [2]	All-Way Stop-Controlled	AM	**>60 (v/c = 1.01)**	**F**	**>60 (v/c = 1.02)**	**F**
		PM	**>60 (v/c = 0.88)**	**F**	**>60 (v/c = 0.88)**	**F**
Durant Avenue/ Piedmont Avenue	All-Way Stop-Controlled	AM	21	C	22	C
		PM	22	C	22	C

Source: Fehr & Peers, August 2010.

[1] *Signalized and all-way stop-controlled intersection delay and LOS based on average control delay per vehicle for the intersection according to the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2000. For intersections operating at LOS F, the volume-to-capacity ratio (v/c) is also reported.*

[2] *Based on the 2000 HCM methodology, the intersection would operate at LOS F during the AM peak hour and LOS D during the PM peak hour under Near-Term No Project and Near-Term With Project conditions. Based on field observations and measurements, the intersection currently operates at LOS F during both AM and PM peak hours due to the high number of pedestrian crossings, which the 2000 HCM methodology does not account for. Thus, the intersection would continue to operate at LOS F during both AM and PM peak hours under Near-Term No Project and Near-Term With Project conditions.*

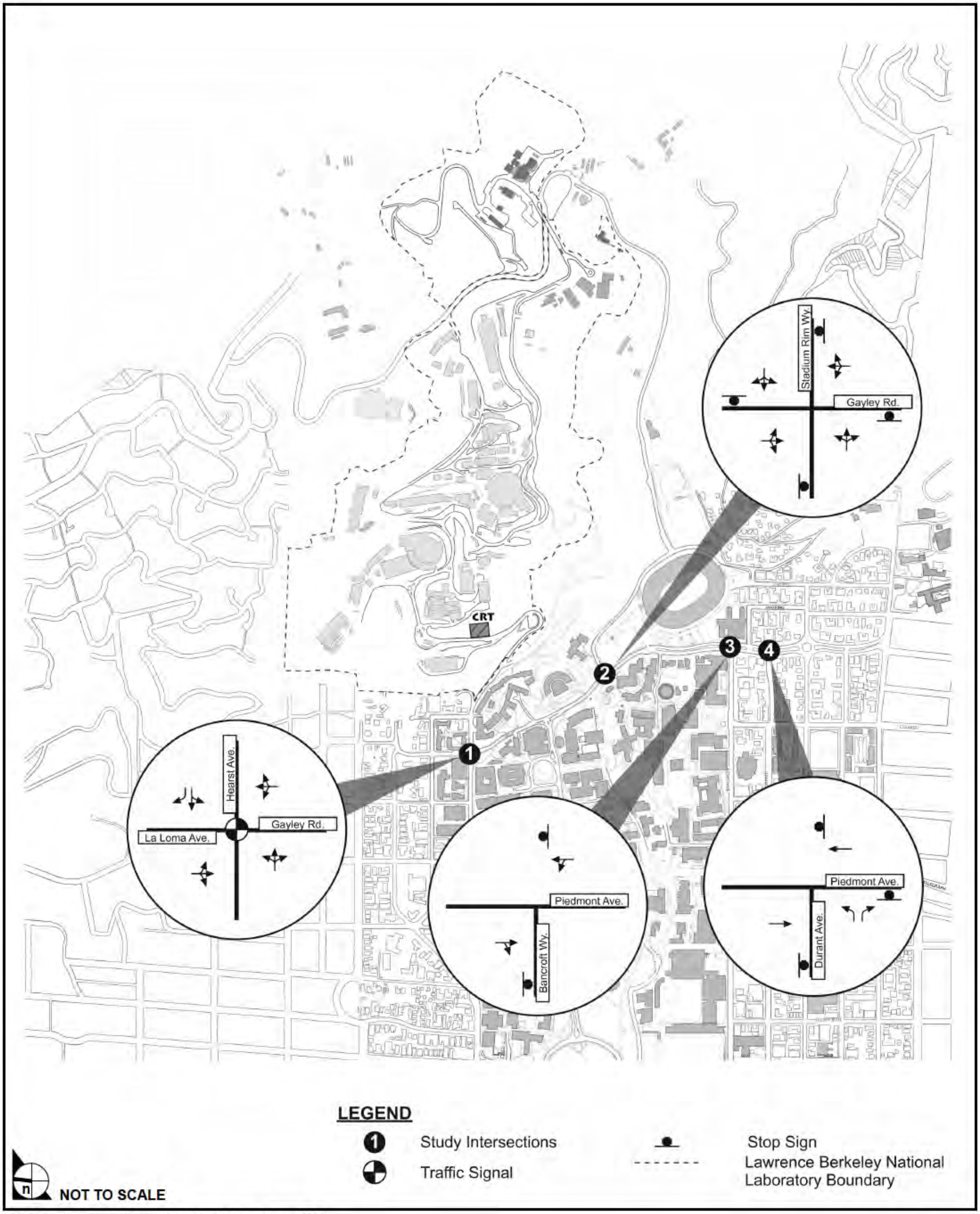
***Bold** indicates an intersection operating at unacceptable LOS E or LOS F.*

Alternative Transit

The proposed CRT project would provide only four disabled access parking spaces and no general use parking. The facility would also include 30 bicycle parking spaces. Employees and visitors would be encouraged to take transit, bicycle, or walk to the site. One of the principles of the LBNL 2006 LRDP is to encourage a higher transit mode share. Pursuant to LBNL SPFs (SPF TRANS-1d), UC LBNL would implement a TDM program which includes specific measures and strategies to encourage and accommodate higher transit use. Thus, the incremental increase in transit demand generated by the CRT project is consistent with the LRDP principle to encourage higher transit use and the expanded TDM program is expected to encourage and accommodate the higher transit use.

5.10.2 Alternative 1, Cafeteria Parking Lot Site

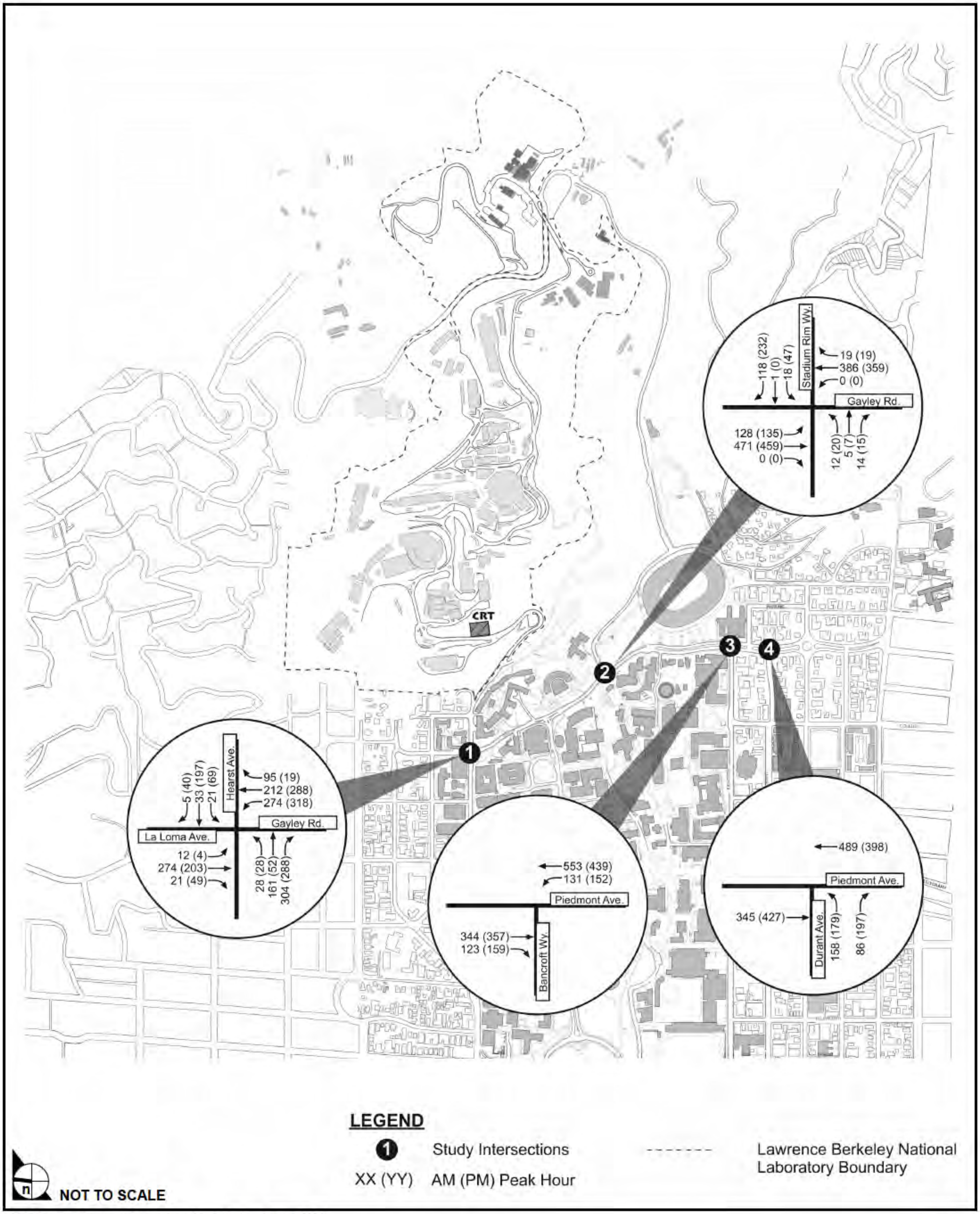
The traffic effects for Alternative 1 would be similar to those described above for the Proposed Action.



SOURCE: Fehr & Peers Transportation Consultants – January 2010

FIGURE 5.0-2

Study Intersection Locations, Lane Configurations, and Traffic Control

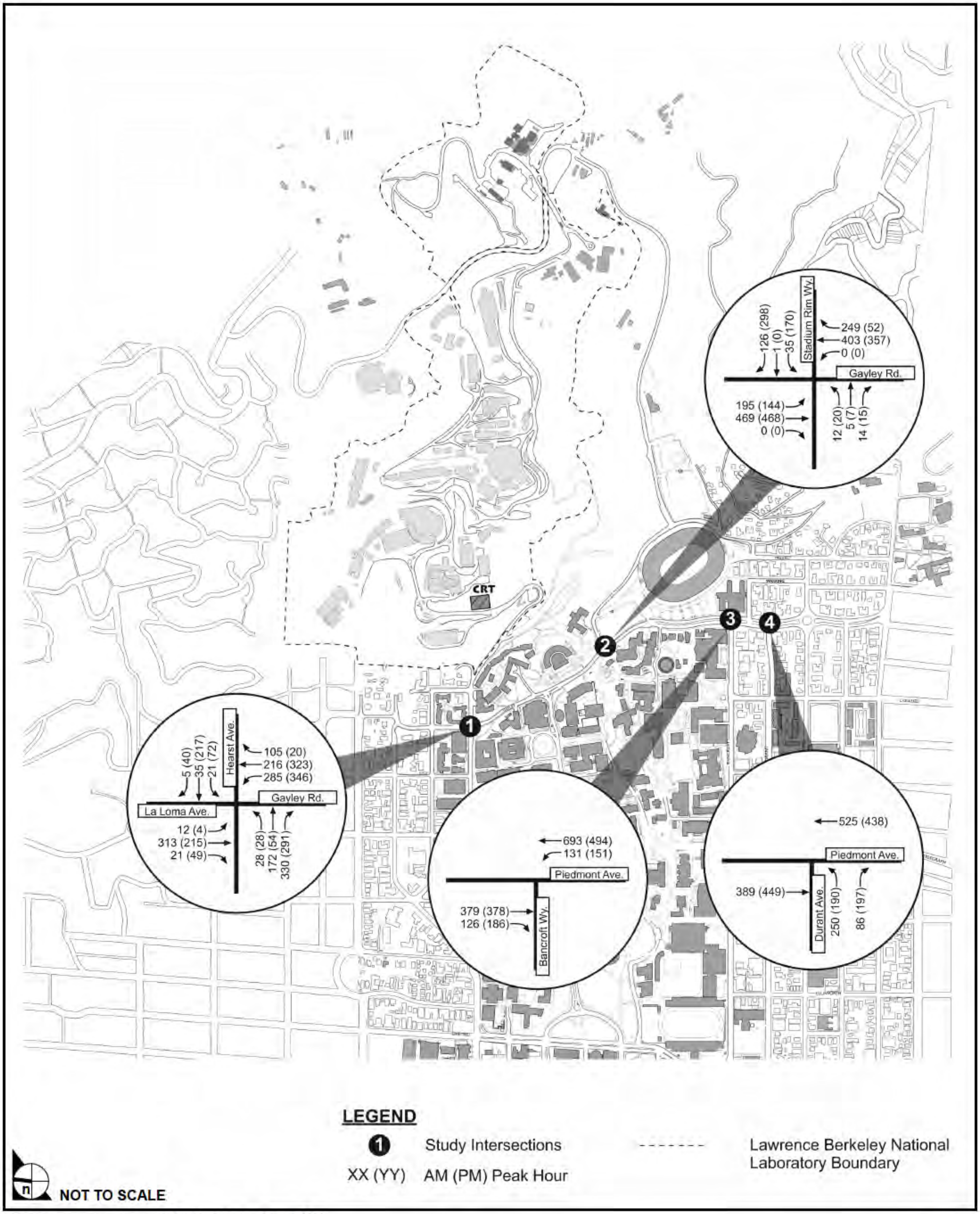


SOURCE: Fehr & Peers Transportation Consultants – January 2010

FIGURE 5.0-3

Existing Peak Hour Traffic Volumes

924-006•02/10

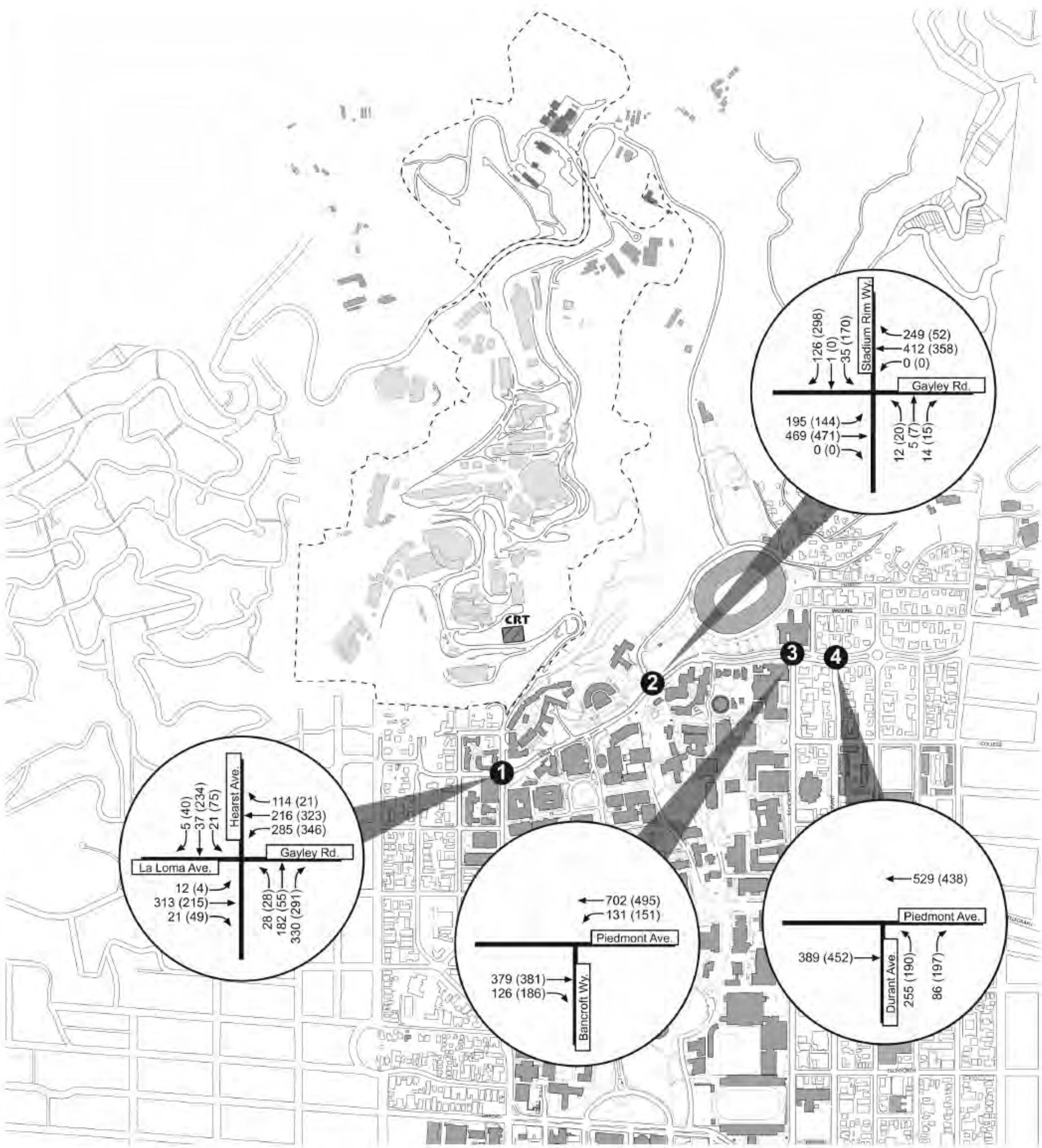


SOURCE: Fehr & Peers Transportation Consultants – January 2010

FIGURE 5.0-4

Near-Term No CRTConditions – Peak Hour Traffic Volumes

924-006•02/10



LEGEND

❶ Study Intersections

XX (YY) AM (PM) Peak Hour

------- Lawrence Berkeley National Laboratory Boundary

NOT TO SCALE

SOURCE: Fehr & Peers Transportation Consultants – January 2010

FIGURE **5.0-5**

Near-Term with CRT Conditions – Peak Hour Traffic Volume

5.10.3 Alternative 2, RFS Site

Under Alternative 2, approximately 300 employees would be added to the RFS site. RFS is located directly off of I-580 and although the site can be accessed via three interchanges, the Regatta interchange provides the most direct access to the site. Vehicles traveling to and from the RFS site via the Regatta interchange travel through one major intersection which is the intersection of Regatta Boulevard and Meade Street, which currently operates at an acceptable level of service in accordance with City of Richmond standards. Conservatively assuming that all 300 employees would drive to the site, it is anticipated that Alternative 2 would generate up to 160 AM peak hour trips and 150 PM peak hour trips, based on trip generation rates for Single Tenant Office uses in the Institute of Traffic Engineers (ITE) *Trip Generation* guide (ITE 2008). Assuming conservatively that all these vehicles would use the Regatta interchange, this volume of traffic when added to the roadway would have little effect.

5.10.4 Alternative 3, Former DHS Site

Under this alternative, it is assumed that no parking would be provided at the former DHS site. Given the site's proximity to the Downtown Berkeley BART station, and the availability of AC transit bus service via a number of bus lines and UC Berkeley and LBNL shuttle service near the site, the majority of the relocating staff are expected to use public transit. Persons who would drive would be expected to use UC parking facilities near the site including the Genetics garage. The addition of a small number of trips by the CRT facility is not expected to adversely affect the road network. The EIR prepared for the UC Berkeley 2020 LRDP concluded that new traffic added by growth on the campus would increase vehicle trips and traffic congestion at the University Avenue and Sixth Street intersection and University Avenue and San Pablo Avenue intersection, leading to substantial degradation in level of service. Alternative 3 would contribute to this cumulative impact. The project would be subject to standard project features required by the UC Berkeley LRDP EIR, which are designed to reduce the impacts of new traffic added by growth on the campus.

5.10.5 Alternative 4, Leased Facility on San Pablo Avenue

The leased facility site is located along a main arterial roadway in the cities of Berkeley, Emeryville, and Oakland. Access to the site is typically from I-80/580 and State Route 24 via Ashby and San Pablo Avenues. Users of the facility could also enter the site from Seventh Street off of Ashby Avenue. Intersections along Ashby Avenue and San Pablo Avenue were evaluated for the *West Berkeley Project Draft EIR*. According to the LOS analysis prepared for that EIR, the intersections of Ashby Avenue and San Pablo Avenue, and Ashby Avenue and Seventh Street currently function at LOS D during the evening peak hour. Although the intersection of Ashby Avenue and San Pablo Avenue is projected to operate at an acceptable LOS (a high LOS D, which means near capacity) in 2015, the intersection of Ashby Avenue and Seventh Street is projected to operate at LOS E in 2015 (Wilbur Smith Associates 2010).

This alternative would involve the relocation of about 300 staff to this site. Because transit is currently available, it is anticipated that many users of the facility would be able to rely on alternative transportation, including shuttle service to be provided from the LBNL site to the facility on San Pablo Avenue. Furthermore, the project would be subject to LBNL SPFs, which are designed to reduce the impacts of new traffic. However, conservatively it is assumed that all persons associated with the CRT facility would drive. Based on trip generation rates for Single Tenant Office uses in the ITE *Trip Generation* guide (ITE 2008), the CRT facility would generate approximately 160 AM peak hour trips and 150 PM peak hour trips. The addition of these peak hour trips to the intersections of Ashby Avenue and San Pablo Avenue and Ashby Avenue and Seventh Street would incrementally increase the delay at these intersections during peak hours. Traffic added by the alternative may adversely affect the intersection of Ashby and San Pablo Avenue, which is forecasted to operate near capacity in 2015. The traffic generated by the alternative would adversely affect intersection operations at Ashby Avenue and Seventh Street by contributing trips to an intersection that would be operating poorly in 2015.

5.10.6 Alternative 5, No Action

The No Action alternative would not result in new vehicle trips and there would be no change compared to existing conditions as a result of the No Action.

5.11 UTILITIES AND WASTE MANAGEMENT

5.11.1 Proposed Action

The facility constructed under the Proposed Action would generate wastewater from restrooms and cooling tower blowdown. There is sufficient treatment capacity at East Bay Municipal Utility District's (EBMUD) wastewater treatment plant to accommodate this wastewater. The wastewater from the site would be directed to the Hearst Monitoring Station and to sub-basin 17-013. Given that sub-basin 17-013 is not constrained during peak wet weather flows, and is expected to have future wet weather capacity, the Proposed Action would not overburden the existing capacity of sanitary sewer systems (LBNL 2008).

Implementation of the CRT facility under the Proposed Action would increase impervious surfaces at the LBNL site by 1.49 acres, which would increase site storm water flows. The existing LBNL storm water drainage facilities have adequate capacity to service existing and future development in the area. The design features incorporated into the facility include a series of subsurface hydromodification vaults that would be sized to hold peak storm flows and release storm water discharge at a rate no greater than the pre-development condition (LBNL 2008).

Water consumption for the CRT facility at full occupancy is estimated at approximately 32 million gallons per year or an average of about 88,000 gallons per day (gpd). This includes demand for domestic water, fire suppression water, and cooling tower water. The proposed facility would include high-efficiency fixtures and storm water reclamation for toilet flushing and recirculation of cooling water, which would reduce water demand. EBMUD prepared and approved a water supply assessment for growth at the LBNL site under the 2006 LRDP. In order to address the water demand for the CRT facility, UC LBNL presented a revised estimate of 80 million gallons of water needed per year by 2025 for all facilities on the LBNL site (compared to a need for about 61 mgy, which was the previous estimate under the 2006 LRDP) to EBMUD. EBMUD indicated that it can provide this volume of water to LBNL from its existing supply sources. Therefore, EBMUD can meet the demands for water associated with the Proposed Action from its existing supply sources (LBNL 2008).

As stated in **Section 4.0**, electrical power at the LBNL site is purchased from WAPA and delivered by PG&E transmission system to the LBNL's Grizzly Peak substation located adjacent to Building 77. The Grizzly Peak substation consists of two DOE-owned transformers with a combined capacity of 100 MW. This substation is exclusively for LBNL use. In addition, power can be supplied to LBNL from UC Berkeley's Hill Area Substation, located adjacent to the Grizzly Substation. Total electrical power consumption at LBNL in 2006 was 71,100-megawatt hours (MWh). The CRT facility would require up to 7.5 megawatts (MW) of power at the time of initial building occupancy, and 17 MW at full buildout of the facility, which corresponds to 148,900 MWh of power consumption per year and represents a three-fold increase in electricity consumption at LBNL. The electricity demands under the Proposed Action would require modifications to the Grizzly Peak substation and transmission facilities within the LBNL site. These modifications would be accomplished entirely within the footprint of existing utilities or the CRT project site and would include use of existing spare breakers at the Grizzly Peak substation, installation of new conductors from the substation to the proposed CRT facility using spare conduits though an existing electrical manhole, and extension of a new duct bank from the existing manhole to the CRT building. The construction of these improvements would take place in areas that are already disturbed, so the potential to encounter cultural and biological resources would be low. In addition, the upgrades would not modify views of the site. The natural gas pipeline segment within the CRT building footprint would be relocated to the north within the CRT site. This relocation would not adversely affect cultural or biological resources for reasons discussed in **Section 5.4, Biological Resources** and **Section 5.5, Cultural Resources**.

5.11.2 Alternative 1, Cafeteria Parking Lot Site

All of the utility requirements at the Alternative 1 site would be substantially similar to the Proposed Action. The environmental impacts would be the same as described above for the Proposed Action.

5.11.3 Alternative 2, RFS Site

An estimated 300 people would be added to the RFS site under this alternative, in comparison to 135 persons added to the LBNL site under the Proposed Action. Therefore, demands for utilities services, including water, wastewater, and solid waste disposal, under the alternative would be higher in comparison. However, based in current usage levels and capacity, it is anticipated that sufficient utilities and service systems would be available for the proposed facility at the RFS site.

Energy demands under the alternative would be the same as the Proposed Action. PG&E provides electricity to the RFS via a 12-kilovolt (kV) electrical line (UC Berkeley 2008). The electrical system is at 65 percent capacity. Assuming the line operates at a maximum load of 600 amperes, the remaining capacity would be 2.5 MW. The CRT facility would require 7.5 MW at facility startup and 17 MW at full buildout. Improvement to the distribution system and a substation would be required which would be constructed on the RFS site and would result in environmental impacts that are described in other sections of this EA, including but not limited to **Section 5.4, Biological Resources; Section 5.5, Cultural Resources; Section 5.6, Visual Resources; Section 5.7, Air Quality; Section 5.8, Greenhouse Gases; Section 5.9, Noise;** and **Section 5.10, Transportation and Traffic**.

The RFS site is not adequately served by high-speed and high-bandwidth networking. This alternative would therefore require installation of ESnet infrastructure. Installation of 100-gigabyte fibers would require considerable extra cost. The environmental impacts from the installation of ESnet within the RFS site are described in other sections of this EA.

5.11.4 Alternative 3, Former DHS Site

Implementation of the proposed facility at the Alternative 3 site would incrementally add to the new academic and support program space anticipated under the UC Berkeley 2020 LRDP EIR. The demand for utilities such as water supply and infrastructure, wastewater facilities, stormwater drainage facilities, and solid waste services associated with new building space was accounted for in the 2020 LRDP EIR. The water demands, wastewater generation, and solid waste demands would not be substantial in comparison to research facilities that involve laboratory uses. However, given that the facility's demand for electricity would be substantial, additional improvements such as installation of power lines using existing conduits and a substation would be needed to ensure that the supply and transmission facilities are available to meet needs of the building. The construction of these improvements would take place in city streets and the former DHS site in areas that are already disturbed. The site is not adequately served by high-speed and high-bandwidth networking. This alternative would therefore require installation of ESnet infrastructure. There is no ESnet infrastructure available at the site and an extension of the cable system will be necessary. The environmental impacts from installing additional cables in city streets would be minimal.

5.11.5 Alternative 4, Leased Facility on San Pablo Avenue

The facility to be leased is already served by existing utilities providers. However, given that the facility's demand for electricity would be substantial, additional improvements such as installation of power lines on existing poles or using existing conduits and a substation would be needed to ensure that the supply and transmission facilities are available to meet needs of the building. Because these improvements would be constructed within city streets and on the 6701 San Pablo Avenue site—environments that are already disturbed, their construction would not result in substantial adverse environmental effects. The site is not adequately served by high-speed and high-bandwidth networking. This alternative would therefore require installation of ESnet infrastructure. Although the environmental impacts from installing additional cables in city streets would be minimal, installation of 100-gigabyte fibers would require considerable extra cost.

5.11.6 Alternative 5, No Action

No changes would occur with respect to utilities under the No Action alternative.

5.12 PUBLIC SERVICES

5.12.1 Proposed Action

The CRT facility would be built to all currently applicable codes and would provide emergency access as required under applicable laws and regulations. The on-site fire station would provide first response capabilities in the event of a fire or hazardous materials release. The on-site security would be addressed in the contract for services between the UC LBNL and the private security firm. The 135 new people that are anticipated under the Proposed Action would represent a small percent of the average daily population of around 4,515 at the LBNL site in 2006. Based on the historic average of calls for police services (approximately 10 calls per year), new staff associated with the Proposed Action would not cause a noticeable increase the number of calls for police services. Given the distance between the LBNL site and the OSF, it is unlikely that the staff from that facility would relocate their place of residence for commuting purposes, therefore the Proposed Action would not likely result in changes to residential populations. The effects from population growth on school and park facilities and services would be minimal.

5.12.2 Alternative 1, Cafeteria Parking Lot Site

If the CRT facility were constructed at the Alternative 1 site, effects on public services would be substantially the same as those described above for the Proposed Action because the population added to the LBNL site would be the same.

5.12.3 Alternative 2, RFS Site

The addition of 300 people associated with the proposed facility would minimally increase demands for law enforcement and fire protection services at RFS. Given that the alternative is not likely to result in relocation of families of staff and researchers, project-related population would place minimal demand on recreational facilities and schools.

5.12.4 Alternative 3, Former DHS Site

Placement of the facility at the former DHS site would minimally increase demands for law enforcement and fire protection services in that area. The demands would be substantially similar to those described under the Proposed Action because the population of the facility would be the same. Similarly, demand on schools and recreational facilities would also not increase.

5.12.5 Alternative 4, Leased Facility on San Pablo Avenue

The facility to be leased at 6701 San Pablo Avenue is already served by existing public services providers. A private security contractor would supplement existing law enforcement personnel serving the project site. Given that the leased facility is generally close to the existing OSF and LBNL sites, it is unlikely that the majority of the relocated staff would move their place of residence in order to work at the Alternative 4 site. Therefore, the alternative would place minimal demand on recreation, parks, and schools in the area.

5.12.6 Alternative 5, No Action

No changes would occur with respect to public services under the No Action alternative.

5.13 POPULATION AND HOUSING, SOCIOECONOMICS, AND ENVIRONMENTAL JUSTICE

5.13.1 Proposed Action

The proposed CRT facility would accommodate approximately 300 employees, of which approximately 250 would be UC LBNL staff and 50 would be UC Berkeley staff and students. Approximately 15 staff could be new or relocated LBNL staff. These new persons would not add substantially to the total population within the Bay Area. Given the distance between the LBNL site and the OSF, it is unlikely that many, if any, of the staff relocating from OSF would relocate their place of residence for commuting purposes.

Construction activities associated with the Proposed Action would draw temporary workers from the local area at the discretion of subcontractors selected to perform the work. All contractors and staff would be hired in compliance with UC and DOE guidelines.

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires agencies to identify and address disproportionately high and adverse human health or environmental effects its activities may have on minority and low-income populations. As stated in **subsection 4.2.13**, minority and low-income populations are present in the census tracts adjacent to the Proposed Action site. However, the Proposed Action would not result in environmental effects or human health risks that could affect minority or low-income populations in the surrounding area. The environmental effects and human health risks associated with the Proposed Action are the subject of this EA; as shown by the analysis in this EA, no adverse environmental consequences are anticipated under the Proposed Action.

5.13.2 Alternative 1, Cafeteria Parking Lot Site

Given that Alternative 1 is also located on the LBNL site, the effects related to population and housing, socioeconomics, and environmental justice would be the same as described above for the Proposed Action.

5.13.3 Alternative 2, RFS Site

The relocation of 300 LBNL and UC staff to the RFS site would not likely result in relocation of the majority of those families since the distance between the LBNL site and the RFS site is approximately 5 miles. Therefore, the alternative would not substantially increase the residential population of Richmond.

The site is largely isolated from the adjoining residential areas in the City due to the location of the freeway and railroad tracks. The nearest residential uses are south and west of the RFS site, approximately 1,500 feet away. Furthermore, this EA found no adverse human health or other effects from the construction and operation of the CRT facility at RFS. Therefore, the alternative would not result in disproportionate impacts to low-income and minority populations.

Similar to the Proposed Action, the hiring of construction contractors and any new staff would be subject to UC and DOE guidelines.

5.13.4 Alternative 3, Former DHS Site

Similar to the evaluation for the Proposed Action site, relocating staff at the DHS site would not likely trigger housing changes in the area given its proximity to the LBNL site and OSF, and therefore the alternative would not substantially increase the residential population of the City of Berkeley.

Although minority and low income populations are present in the census tracts near the DHS site, this EA found no adverse human health effects from the construction and operation of the CRT facility at this site. This EA found that construction of the facility at the DHS site would elevate noise levels above the City's thresholds for residential land uses. Although the apartments adjacent to the DHS site would be exposed to elevated noise levels during construction, the effects would be temporary. Furthermore, the elevated noise levels would not disproportionately affect the minority or low-income populations compared to all populations in the areas. Therefore, the alternative would not result in a disproportionate impact on low-income and minority populations.

The hiring of new staff related to construction and operation of the project would be consistent with UC and DOE policy.

5.13.5 Alternative 4, Leased Facility on San Pablo Avenue

Relocation of staff to the leased facility at 6701 San Pablo Avenue would not result in substantial residential relocation because the facility is less than 4 kilometers (2.5 miles) away from the LBNL site and approximately 5 kilometers (3 miles) away from the OSF site. Therefore, the alternative would not substantially increase the residential population of the cities of Berkeley, Emeryville, or Oakland.

Minority and low income populations are present in the census tracts near the leased facility at 6701 San Pablo Avenue. This EA found that construction of the facility at the San Pablo Avenue site would elevate noise levels above the City's thresholds for residential land uses. Although the apartments adjacent to the leased facility site would be exposed to elevated noise levels during construction, the effects would be temporary. Furthermore, the elevated noise levels would not disproportionately affect the low-income populations compared to all populations in the areas. Therefore, the alternative would not result in a disproportionate impact on low-income and minority populations.

5.13.6 Alternative 5, No Action

No changes would occur with respect to population, housing, socioeconomics, and environmental justice under the No Action alternative.

5.14 CONSTRUCTION TRAFFIC ACCIDENTS

Accidents are discussed in various different sections of this EA. For accidents due to earthquakes and landslides, see **Section 5.1, Geology and Soils**. For information about risks from hazardous materials and wildland fires, and a description of emergency response, see **Section 5.3, Hazards, Human Health, and Accidents**. Traffic accidents are discussed below.

5.14.1 Proposed Action

The Proposed Action would not change the physical characteristics of the street network on the site or along the designated truck route. Construction traffic generated by the Proposed Action would be controlled by the Site Construction Coordinator and would be maintained below the level required to avoid exceeding City of Berkeley thresholds governing intersection operations, roadway segment operation, and pavement conditions. In other words, there would not be a considerable increase in construction truck traffic and therefore no corresponding increase in potential for traffic accidents compared to existing conditions. Furthermore, truck traffic contributed by the Proposed Action would not in itself increase the potential for traffic accidents to occur. Therefore, there would be no reasonably foreseeable increase in risk to health and safety from transporting demolition or construction material associated with the Proposed Action.

5.14.2 Alternative 1, Cafeteria Parking Lot Site

The potential for truck collisions during construction of Alternative 1 would be similar to those described above for the Proposed Action.

5.14.3 Alternative 2, RFS Site

As described above in **Section 5.10, Transportation and Traffic**, the intersection of Syndicate Street and Meade Street, between the RFS site main entrance and the freeway, currently operates at an acceptable level of service. Given that construction trucks have only a short distance to travel from the RFS site entrance to the freeway, and the intersection has relatively low volumes of traffic, the risk of traffic accidents on Richmond Streets related to construction of Alternative 2 would be low.

5.14.4 Alternative 3, Former DHS Site

Given that trucks from the Alternative 3 site would follow the same truck route as the Proposed Action, the potential for collisions from construction trucks would be similar. As explained in **subsection 5.14.1,** this potential risk would be minimal.

5.14.5 Alternative 4, Leased Facility on San Pablo Avenue

Under Alternative 4, construction traffic would be limited because construction would be confined to interior modifications and the addition of a floor to an existing building and no grading activities would be needed. Construction traffic would travel through two or more intersections that operate at a LOS D. However, given the limited number of trucks needed for construction, the risk of traffic accidents associated with construction at the Alternative 4 site would be low.

5.14.6 Alternative 5, No Action

There would be no construction associated with the No Action Alternative. Therefore, no construction traffic accidents would occur.

6.0 CUMULATIVE EFFECTS

Cumulative environmental effects consider the combined effects on the environment of the Proposed Action in combination with past, present, and anticipated future actions. **Table 6.0-1, Cumulative Projects,** presents an inventory of recently completed, ongoing, planned, pending, and/or reasonably foreseeable proposed actions in the surrounding area and generally in the same timeframe as the Proposed Action (between 2010 and 2018). The listed projects, which include Department of Energy (DOE) projects at Lawrence Berkeley National Laboratory (LBNL), University of California (UC) projects at LBNL and on the adjacent UC Berkeley campus, and, for some analyses, UC projects in the adjacent City of Berkeley, were considered in the evaluation of cumulative effects. As appropriate, general growth in the City of Berkeley through 2018 was also considered in the analysis. Projects located at the LBNL site are shown in **Figure 6.0-1, Cumulative Projects**.

The University of California's Computational Research and Theory (CRT) Facility Final Environmental Impact Report, certified in 2008, considers cumulative impacts out to 2025, which is the planning horizon for the 2006 LBNL LRDP. The 2006 LRDP provides guidance for any future development at LBNL without the assurance that such development will occur. LRDP growth projections include projects that would only be executed if and when funding becomes available. Such funding has historically been very much open to question. Absent financing, the projections are not reasonably foreseeable. By contrast, this EA considers the cumulative effects of projects which have reached a "Critical Decision – 0" approval (or where funding is otherwise anticipated) and are therefore reasonably foreseeable. Accordingly, the timeline for cumulative effects has been set at 2018, which is the anticipated completion date of Seismic Phase 3, the latest project that has reached a Critical Decision – 0 approval. Any National Environmental Policy Act (NEPA) document prepared on Seismic Phase 3 would, of course, account for any projects, which are reasonably foreseeable at that time. The approximate planned time frame of each of the cumulative projects as known in August 2010 is presented in **Table 6.0-1.**

Table 6.0-1
Cumulative Projects

	2010	2011	2012	2013	2014	2015	2016	2017	2018
CRT Proposed Action									
Projects at LBNL									
User Support Building									
Building 25 Demolition									
General Purpose Lab									
Old Town Demolition									
Solar Energy Research Center									
Seismic Phase 1 Building 50									
Seismic Phase 2									
Seismic Phase 3									
Building 55 Demolition									
Building 51 and Bevatron									
Building 71 BELLA									
Building 71 Trailer Demolition									
User Test Bed Facility									
Building 74 Modernization									
Building 85 Seismic Strengthening									
Projects at UC Berkeley									
SCIP East – SAHPC									
SCIP East – Stadium Seismic Upgrade									
SCIP West – Law School Infill									
SCIP West – Utilities/ROW in Piedmont Avenue									
SCIP West – Gayley Road Storm and Sewer									
Campbell Hall Replacement									

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Blum Center/Naval Architecture									
Warren Hall Replacement/Li Ka Shing Center									
Community Health Campus Phases 1 and 2									
Tolman Hall Seismic Renovation									
Lewis Hall Seismic Renovation									
Mulford Hall Seismic Renovation									
Dwinelle Annex Renovation									
Hearst Gym Renovation									
Anna Head Housing									
Ellsworth Student Housing									
DHS Demolition/Helios									
Berkeley Art Museum/PFA									
Bowles Hall Renovation									
Stern Residence Hall Renovation									

The table above does not include the Next Generation Light Source (NGLS). The Next Generation Light Source (NGLS), as envisioned, would be a linear accelerator "light source" capable of producing extraordinarily bright, short, soft x-ray pulses at rates of hundreds of thousands of times per second. Soft x-rays are ideal for studying solar cells, fuel cells, advanced electronics, biological systems, cleaner catalysts, and high-temperature superconductors. If located at the LBNL site, the NGLS could be a national user facility available not only to scientists at LBNL and UC Berkeley but also to researchers around the nation and the world. While the idea of locating the NGLS at the LBNL site is being actively studied by Laboratory management, UC LBNL has not formally proposed this to the DOE, nor has it entered into the required DOE "Critical Decision" process for the NGLS. Consequently, the NGLS is not considered a reasonably foreseeable project at LBNL at this time. Because NGLS at LBNL is not a reasonably foreseeable project at this time, the NGLS is not considered further in this NEPA analysis.

Currently, there are no foreseeable development projects planned at the RFS[1] or in adjacent areas of the City of Richmond (DOE 2010). Therefore, the only cumulative impacts related to Alternative 2 at the RFS are greenhouse gas emissions and air quality. Discussions of these cumulative issues are located in this chapter.

6.1 CONSTRUCTION PROJECTS NEAR THE PROPOSED ACTION

6.1.1 DOE Projects at LBNL

User Support Building

The three-story, approximately 2,787-square-meter (30,000-gross-square-foot [gsf]) User Support Building will include assembly space, support laboratories, and offices. An existing 1,489-square-meter (16,038-gsf) structure, Building 10, which housed approximately 24 full-time LBNL staff, was demolished to create space for the User Support Building. A California Environmental Quality Act (CEQA) Initial Study/Mitigated Negative Declaration was prepared and circulated in fall 2006 and adopted by the UC Board of Regents (The Regents) in January 2007. A categorical exclusion was filed for the project under NEPA in December 2006. Demolition of Building 10 was completed in 2007. Construction of the User Support Building was initiated in June 2008 and is expected to be completed by late 2010.

Old Town Demolition

This project covers the demolition, decontamination, and environmental restoration of certain buildings in the LBNL "Old Town" area in the center of the LBNL site. Depending on funding, up to 14 buildings (approximately 5,100 square meters [55,000 gsf]) would be demolished, including Buildings 4, 5, 7, 7C, 14, 16, 25A, 40, 41, 44, 44A, 44B, 52, and 52A. In addition, any contaminated soil under these structures would be remediated, and groundwater treatment systems would be installed, if necessary, within the approximately 3-acre project area. A categorical exclusion was filed for the project under NEPA in December 2009. Based on an environmental checklist completed in December 2009, this project was determined to be within the scope of the LBNL 2006 LRDP EIR pursuant to *State CEQA Guidelines* Section 15168. The project was approved in December 2009. Work is expected to commence in mid-2010 and be completed in mid-2013.

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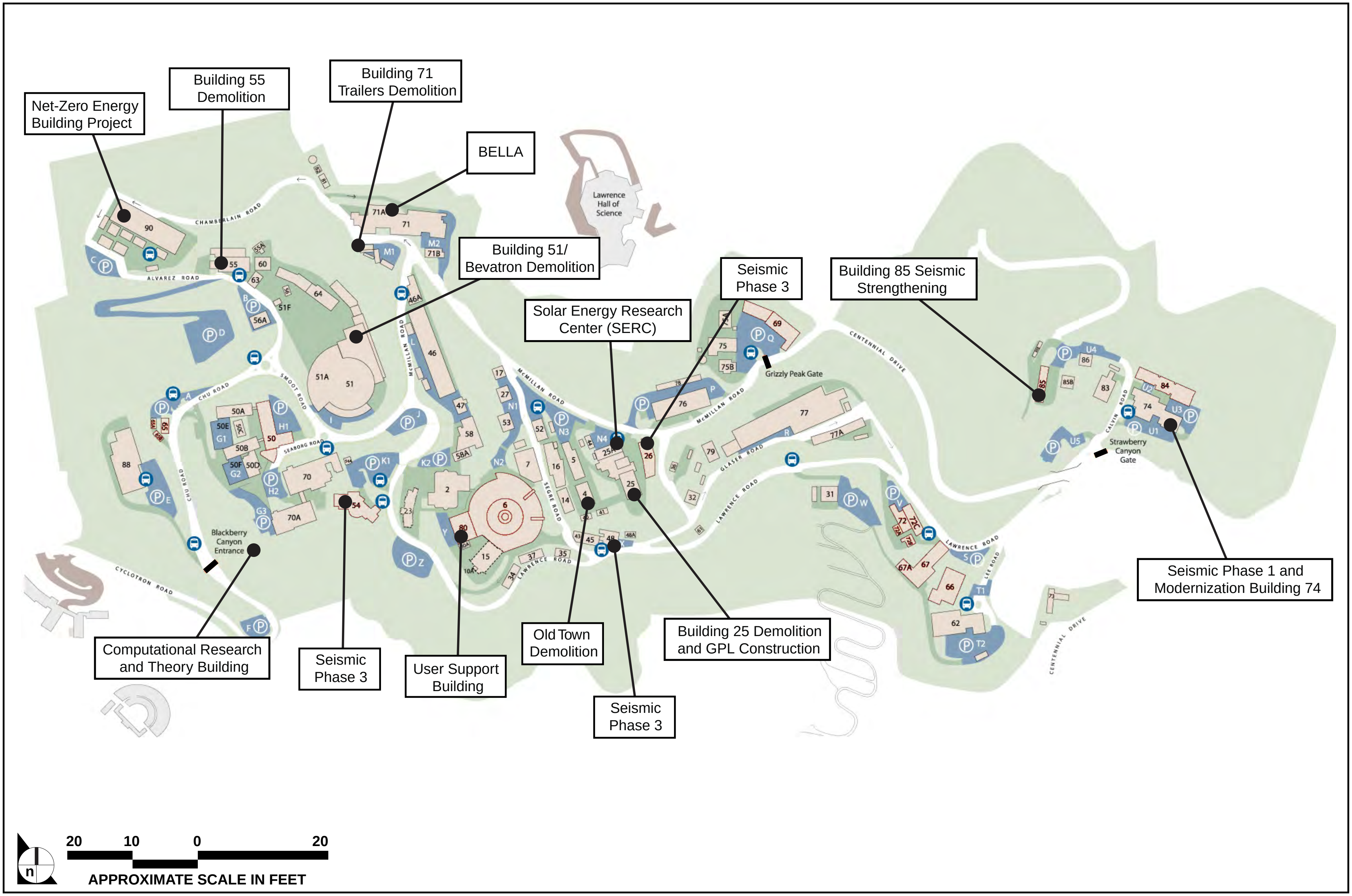
1 A specific plan for development of the RFS is expected to be prepared in the coming months.



SOURCE: Impact Sciences, Inc. – February 2010

FIGURE **6.0-1**

Cumulative Projects

924-006•08/10

Seismic Phase 1

Seismic Phase 1 is intended to correct structural deficiencies in LBNL Buildings 50 and 74 in order to improve their performance in a seismic event and upgrade the seismic rating of the buildings from "Poor" to "Good," in accordance with the UC Seismic Safety Policy. Seismic Phase 1 work for Building 74 was finished in late 2009 and the work for Building 50 is expected to finish in mid-2010. This work is covered under a categorical exemption under CEQA and a categorical exclusion under NEPA.

Seismic Phase 2

Seismic Phase 2 would involve the demolition of 3,995 square meters (43,000 gsf) of space contained in several older seismically poor and very poor buildings and replacement with a similar amount of space in a single new facility that would be built to higher seismic safety standards. UC LBNL has vacated the most seismically deficient buildings, which has created a need for suitable safe and modern replacement space. The project would demolish Buildings 25/25B, Building 55, and Building 71 trailers C, F, J, K, and P. Building 25/25B is located at the center of the LBNL site in the Old Town area. Buildings 55 and 71 are located in the northwest of the LBNL site. The new 3,995-square-meter (43,000-gsf) general-purpose laboratory would be built on site where Buildings 25/25B are now located. Building 85 would be seismically strengthened. The project would not result in any population growth at the LBNL site. The University of California certified the Final EIR for this project in July 2010. In addition, DOE issued the Final Environmental Assessment/FONSI (Finding of No Significant Impact) for this project on August 4, 2010.

Seismic Phase 3

Seismic Phase 3 would involve construction of a new 4,645-square meter (500,000-gsf) general-purpose laboratory (GPL) that would replace the existing seismically deficient buildings. The project would also upgrade and modernize, or replace four buildings on the LBNL site that are rated as seismically "Poor" based on the University of California Seismic Safety Policy Rating. The project would upgrade and modernize Building 26 (929 square meters [10,000 gsf]). The project would upgrade and modernize Building 54 (1,394 square meters [15,000 gsf]) or replace it with a new approximately 1,859-square-meter (20,000-gsf) conference and food service center. The existing fire station (Buildings 45 and 48) would be replaced with a new modern 464-square-meter (5,000-gsf) fire station. The project would demolish an equal amount of gross square footage of seismically "Poor" rated buildings to the amount of new building space that is built. The project has not yet undergone environmental review. Final details of the new GPL would be determined by DOE staff in order to meet cost targets and schedule deadlines. It is anticipated that no new population would be added to the LBNL site as a result of this project and that the project would allow research programs that are currently in compressed and inadequate spaces to move into more appropriate spaces.

Building 51 and the Bevatron Demolition

An EIR was certified in July 2007 for the demolition and removal of the Building 51 complex, including the Bevatron (a retired particle accelerator), and the concrete blocks and building shell surrounding it. This EIR was tiered from the 1987 LRDP EIR, as amended. A NEPA EA/FONSI for the project was signed in April 2008. Demolition commenced in August 2008 and is expected to continue through early 2011.

Berkeley Lab Laser Accelerator

The Berkeley Lab Laser Accelerator (BELLA) will be housed almost entirely within Building 71, involving modifications to the internal structure to support a shielded experimental cave and support functions. The cave will house a new laser accelerator system. An additional utility room will be built on the roof. The project is covered under a CEQA categorical exemption and a NEPA EA/FONSI signed in September of 2009. Construction is scheduled to take approximately 18 months, ending approximately by 2012.

User Test Bed Facility

The User Test Bed Facility project would consist of a series of energy-efficient building "testbeds" in the new and existing buildings to allow researchers to conduct measurements of energy use with various prototype-building systems such as windows, lights, heating, ventilation, and air conditioning (HVAC), roofs, and skylights. The project is in a very early stage of development and, at this time, it appears that the facility would be built primarily by renovating existing floor space in Building 90 and possibly adding a small building next to Building 90 on a parking lot. The anticipated project is assumed to include a 929-square-meter (10,000-gsf) building, but the building may not be built or may be less than 929 square meters (10,000 gsf). The project would add less than 10 new employees to the LBNL site. The project was awarded funding in December 2009, but has not yet undergone environmental review. Final details of the new facility will be determined by DOE staff in order to meet cost targets and schedule deadlines.

Building 74 Modernization

Building 74 modernization work includes a renovation of the entire building, including new mechanical, electrical, and plumbing systems; new interior partitions; finishes; and laboratory casework. The interior of the building would be remodeled. The work is due to be completed in mid-2012. The project was included in the 2006 LRDP EIR under CEQA and approved under a categorical exclusion under NEPA.

6.1.2 University of California Projects at LBNL

Solar Energy Research Center

The goal of the Solar Energy Research Center (SERC) project is to accelerate the development of sustainable solar energy sources through various initiatives, such as the development of new materials for use in collectors, efficient processing steps, and energy handling. SERC would be an approximately 3,530-square-meter (38,000-gsf) building devoted to research on new photovoltaic and electrochemical solar-energy systems. The site under consideration for this project is the Building 25A demolition site. Construction is currently anticipated to begin in mid-2011 and end in early 2013. Environmental review of this project has not been completed at this time.

6.1.3 University of California Projects on UC Berkeley Campus

Southeast Campus Integrated Projects

Southeast Campus Integrated Projects (SCIP) include seismic and program improvements to California Memorial Stadium, including a 14,679-square-meter (158,000-gsf) athletic training center, construction of a parking structure and sports field at the current site of Maxwell Family Field, construction of a 17,280-square-meter (186,000-gsf) building linking the Law and Business schools, landscape improvements for the Southeast Campus along Piedmont Avenue, interior improvements at selected buildings at the School of Law and the Haas Business School, and renovation and restoration of four historic houses on Piedmont Avenue. The Campus has committed in a recent settlement with Panoramic Hill Association that when it proposes the Maxwell Family Field parking structure, the total capacity would not exceed 546 parking spaces.

Construction of the athletic training center, School of Law facilities, and retrofit of the Piedmont Avenue houses is currently underway. Construction of all SCIP projects is expected to end in late 2012 with completion of improvements to California Memorial Stadium.

Various Construction Projects

The University has planned several projects to correct seismic and other deficiencies, through renovation or replacement, at the UC Berkeley campus. These projects would replace the space that is demolished or add generally small amounts of new space at these existing building sites.

- **Law School Infill:** 4,838-square-meter (52,072-gsf) demolition/construction, 2011 through 2013.

- **Northeast Quadrant Science and Safety Projects**: demolition of 9,290 square meters (100,000 gsf) and construction of 39,948 square meters (430,000 gsf) of laboratory and classroom space, currently under construction.
- **Campbell Hall Replacement:** 5,946-square-meter (64,000-gsf) demolition and 7,618-square-meter (82,000-gsf) construction, 2011 through 2013.
- **Naval Architecture Restoration and Blum Center:** 1,208 square meters (13,000 gsf) construction, completion in fall 2010.
- **Warren Hall Replacement/Li Ka Shing Center:** 7,339-square-meter (79,000-gsf) demolition and 18,581-square-meter (200,000-gsf) construction, completion 2011.
- **Community Health Campus, Phases 1 and 2:** 300,000 gsf construction, 2011-2012 (14,865 square meters [160,000 gsf]), 2015-2016 (13,006 square meters [140,000 gsf])
- **Tolman Hall Seismic Renovation:** 22,947-square-meter (247,000-gsf) demolition/construction, 2012 through 2013.
- **Lewis Hall Seismic Renovation:** 6,327-square-meter (68,100-gsf) demolition/construction, 2015 through 2016.
- **Mulford Hall Seismic Renovation:** 8,686-square-meter (93,500-gsf) demolition/construction, 2012 through 2013.
- **Dwinelle Annex Renovation:** 817-square-meter (8,800-gsf) demolition/construction, 2016 through 2017.
- **Hearst Gym Seismic and Program Renovation and Expansion:** 11,520-square-meter (124,000-gsf) demolition/construction, 2017 through 2018.

Vegetation Management Projects

The University has applied, through the State of California Governor's Office of Emergency Services, to the Federal Emergency Management Agency (FEMA) for funding under the Pre-Disaster Mitigation (PDM) Program to conduct vegetation management activities in Strawberry Canyon, Claremont Canyon, and Frowning Ridge. The vegetation management activities would involve removal of non-native trees, including approximately 10,000 stems of eucalyptus trees from Strawberry Canyon, approximately 12,000 stems of eucalyptus trees from the Claremont Canyon area, and approximately 24,000 stems of eucalyptus and pine trees from the Frowning Ridge location. Each project would take place over a three-year period. Environmental review of the projects has not been completed.

6.1.4 University of California Projects in the City of Berkeley

Anna Head West Student Housing Project

The student housing project would be constructed on the site of a campus surface parking lot. The project would construct 13,285-square-meter (143,000-gsf) new building space, and would add 424 beds to the campus vicinity. The project would also include spaces for study, computing, and fitness; apartments for a resident director and resident faculty member; and offices for academic advising. Construction would take place from late 2010 to mid-2012.

Ellsworth Student Housing Project

The project would be constructed on the site of a campus surface parking lot roofed with a tennis deck, and would include spaces for study, computing, and fitness; apartments for a resident director and resident faculty member; and offices for academic advising. The project would add 466 new bed spaces to the campus vicinity. Construction would occur in 2016 through 2017.

Helios Project

As part of the approved Helios Energy Research Facility project, the University demolished the approximately 19,500-square meter (210,000 gsf) of built space at 2151 Berkeley Way (the former California Department of Health Services, or DHS). The project will develop the initial elements of a site-wide circulation and open space plan, and construct a new laboratory and office building of approximately 10,500-square-meters (112,800 gsf). Construction is expected to be completed in late 2012.

Other UC Berkeley Projects

The following projects are relevant to the evaluation of cumulative effects due to air emissions and traffic associated with construction activities:

- **Berkeley Art Museum/Pacific Film Archive:** 13,192-square-meter (142,000-gsf) renovation/ construction, mid-2011 to late 2014.
- **Bowles Hall Renovation:** 6,780-square-meter (73,000-gsf) demolition/construction, 2012–2013
- **Stern Residence Hall Renovation:** 8,802-square-meter (87,000-gsf) demolition/construction, 2014-2015

6.1.5 East Bay Regional Park District Project

The East Bay Regional Park District (EBRPD) has one project that is approved for implementation in the vicinity of the LBNL site. The approved EBRPD Wildfire Hazard Reduction and Resource Management Plan provides for vegetation treatment throughout the East Bay Regional Park District, including some areas in Tilden Regional Park near the LBNL site. The project would involve removing vegetation to avoid the risk of catastrophic wildfires along the wildland-urban interface. The plan covers approximately 19,000 acres of parkland. Currently, there is no projected phasing for implementation of this plan.

6.2 TOPICAL EFFECTS

6.2.1 Geology and Soils

Proposed Action

The study area for consideration of the cumulative effects of geological and seismic hazards consists of the locations where UC LBNL personnel work and are exposed to these geological and seismic hazards during their working day.

The Proposed Action in conjunction with the other projects proposed at LBNL and UC Berkeley would increase the average daily populations of the LBNL and UC hill campuses, an area that would be subject to strong ground shaking in a major earthquake on the Hayward Fault. The new buildings associated with the cumulative projects would also be subject to hazards associated with seismically induced landslides and instable soil conditions. It is not possible to eliminate the risk for facilities built in earthquake-prone areas, nor is it possible to fully avoid all geologic hazards. However, these hazards would be reduced to the extent practicable through implementation of and compliance with adopted building codes and regulations. Building codes and local construction requirements have been established to protect against building collapse and major injury during a seismic event. The Proposed Action would implement state seismic construction regulations, and erosion control measures as described in **Section 5.1, Geology and Soils**. Construction in conformance with the California Building Code, local building codes, where applicable, and other pertinent regulations and guidelines would reduce the risks of injury and structural damage from ground shaking, earthquake-induced landslides, and other seismic and geologic hazards to a minimal level.

Alternative 1: Cafeteria Parking Lot Site

Cumulative effects related to geology and soils under this alternative would be similar to the effects of the Proposed Action

Alternative 2: RFS Site

Cumulative effects related to geology and soils under this alternative would be similar to the effects of the Proposed Action.

Alternative 3: Former DHS Site

The Alternative 3 site is not located in an area subject to liquefaction or landslides and would not contribute to a cumulative effect related to geology and soils.

Alternative 4: Leased Facility on San Pablo Avenue

The Alternative 4 site is not located in an area subject to liquefaction or landslides and would not contribute to a cumulative effect related to geology and soils.

Alternative 5: No Action

There would be no cumulative effects related to geology and soils under this alternative.

6.2.2 Water Resources

Proposed Action

The LBNL site is located above the East Bay Plain aquifer. The local aquifer is not a source of drinking water. The LBNL site and surrounding communities receive their water from the East Bay Municipal Utility District (EBMUD) and do not obtain water from the groundwater aquifer (LBNL 2007). Therefore, no water from the aquifer would be withdrawn as a result of the past, present and future development at the LBNL site. Furthermore, the Proposed Action does not involve any activities that could contaminate groundwater.

The study area for consideration of cumulative effects to surface water resources is the Blackberry Canyon watershed affected by the Proposed Action. This watershed is a small area at the northwestern end of the LBNL site. For potential cumulative effects on water resources, only those projects that would include grading, excavation, new exterior construction, and/or intensified land use that are in the same watershed would be expected to be capable of adding to cumulative water resources effects.

With the exception of the Proposed Action, none of the other projects proposed at LBNL would be located within the Blackberry Canyon watershed. None of the UC Berkeley projects to be developed through 2018 would be located in this watershed. The CRT facility includes design features to ensure that pre-development flows are not exceeded by post-development flows. These measures would help avoid substantial hydromodification in the Blackberry Canyon, and therefore substantial erosion of the creek system would be avoided. The cumulative effect of the Proposed Action in conjunction with past development in this watershed on surface water quality in terms of erosion and sedimentation would therefore be minimal.

Alternative 1: Cafeteria Parking Lot Site

Cumulative effects related to water resources would be similar to the Proposed Action under this alternative.

Alternative 2: RFS Site

Development of Alternative 2 would increase storm water runoff at the RFS site; however, it would not contribute to a substantial cumulative effect as implementation of relevant standard project features (SPFs) from the 2006 LRDP EIR and compliance with NPDES requirements would minimize all water quality effects.

Alternative 3: Former DHS Site

Development of Alternative 3 would not contribute to a cumulative effect related to water resources as it would not increase storm water runoff.

Alternative 4: Leased Facility on San Pablo Avenue

Development of Alternative 4 would not contribute to a cumulative effect related to water resources as it would not increase storm water runoff.

Alternative 5: No Action

There would be no cumulative effects related to water resources under this alternative.

6.2.3 Hazards, Human Health, and Accidents

Proposed Action

The immediate vicinity of the Proposed Action is the study area for consideration of the cumulative effects of hazards and risks to human health. These locations include areas where LBNL personnel work and are exposed to hazards, and land around the buildings that could be affected by the release of contaminants to soil and groundwater.

Implementation of the Proposed Action and other proposed projects at LBNL through 2018 would not substantially increase storage of hazardous materials and generation of hazardous wastes at LBNL and in the vicinity of LBNL because most projects at the LBNL site involve removal of outdated buildings and remediation of existing contamination. To the extent that the demolition activities generate hazardous waste, the projects would be required to comply with applicable federal, state, and local regulations governing the handling of hazardous materials and hazardous wastes. Compliance with applicable regulations would result in a minimal cumulative effect related to risk of accidents involving hazardous materials. The Proposed Action would not contribute to this impact.

Development of the LBNL projects listed in **Table 6.0-1** would incrementally increase both laboratory and other facility space at the LBNL site, potentially increasing the population at risk from wildland fires. Although any development at LBNL, including the Proposed Action, would meet required safety standards and fire codes at the time of individual facility construction, wildland fire hazards would continue to threaten the LBNL site. However, continued implementation of LBNL's vegetation management program would limit damage to assets from these fires and would reduce potential cumulative wildland fire hazards effects. The Proposed Action would be subject to LBNL's vegetation management requirements, as well as LBNL and building code requirements for fire resistance. The cumulative effect related to wildland fire hazards resulting from the Proposed Action and other considered projects would be minimal.

Alternative 1: Cafeteria Parking Lot Site

Cumulative effects related to hazards, human health, and accidents under this alternative would be similar to those under the Proposed Action.

Alternative 2: RFS Site

Development of Alternative 2 would incrementally increase handling of hazardous materials and wastes at the RFS site. However, compliance with applicable regulations would result in a minimal cumulative effect related to risk of accidents involving hazardous materials.

Alternative 3: Former DHS Site

Development of Alternative 3 would not contribute to the risk of exposing people or structures to wildland fires given the location in an urban setting. As with the Proposed Action, compliance with applicable regulations would result in a minimal cumulative effect related to risk of accidents involving hazardous materials.

Alternative 4: Leased Facility on San Pablo Avenue

Development of Alternative 4 would not contribute to the risk of exposing people or structures to wildland fires given the location in an urban setting. As with the Proposed Action, compliance with applicable regulations would result in a minimal cumulative effect related to risk of accidents involving hazardous materials.

Alternative 5: No Action

There would be no cumulative effects related to hazards, human health, and accidents under this alternative.

6.2.4 Biological Resources

Proposed Action

The affected environment for consideration of cumulative effects to biological resources under the Proposed Action is the East Bay hills.

With the exception of the CRT facility, most of the other projects proposed at the LBNL site involve existing buildings and would not affect sensitive biological resources because the site of each project is already disturbed. All LBNL projects would implement SPFs to avoid or minimize short-term construction-phase effects on biological resources. With the exception of the three UC Berkeley-proposed fire fuel reduction projects, projects proposed on the UC Berkeley campus would also be located in developed areas where sensitive biological resources would generally not be present. In compliance with the campus's 2020 LRDP, all UC Berkeley projects would be required to implement continuing best management practices that would avoid or minimize impacts on sensitive biological resources. The fuel management projects proposed by UC Berkeley would involve the removal of approximately 44,000 resprouted eucalyptus stems, other non-native trees, and some pine trees over an area of approximately 170 acres located in Strawberry and Claremont canyons. The projects would be implemented generally outside the nesting season and would comply with the UC Berkeley 2020 LRDP that requires nesting bird surveys before tree removal, replacement of specimen trees, and precautions to avoid discharge of sediment and other pollutants into surface water during ground disturbing activities. As these fire fuel reduction projects would be federally funded, they would also implement conservation measures for the protection of Alameda whipsnake (and other federally listed species) as required by the U.S. Fish and Wildlife Service. The fire fuel reduction projects would be beneficial for wildlife species as they would remove non-native species and promote native forests and scrub habitats. New development occurring under the Berkeley or Oakland general plans in the area would primarily be considered infill in areas zoned as residential and there are no large developments pending in the area under these plans. The EBRPD currently has no plans for large facilities development or reductions in open space at Tilden Park. The park district's vegetation treatment project to reduce fire hazard would also be beneficial for wildlife species as they would remove non-native species, promote native forests, and scrub habitats. Implementation of LBNL projects proposed through 2018 would result in the development of less than 5 acres of available open space and habitat at the site, which includes the loss of open space associated with the Proposed Action. UC Berkeley projects developed during the Proposed Action time frame would not occur on existing open space in the Hill Campus. Therefore, LBNL and UC Berkeley growth through 2018 would not result in a substantial reduction in open space or wildlife habitat

Alternative 1: Cafeteria Parking Lot Site

Cumulative effects related to biological resources would be similar to the Proposed Action under this alternative, although it would result in the removal of fewer trees.

Alternative 2: RFS Site

Development of Alternative 2 could contribute to the loss of California Oatgrass Bunchgrass Grassland (*Danthonia californica*) and purple needlegrass (*Nassella pulchra*), which are sensitive natural communities that are present on the site. Alternative 2 also has a greater potential to affect wetland habitat than the Proposed Action. The effects of both of these potential impacts would be reduced by the implementation of LBNL SPFs. Therefore, Alternative 2 would not have a substantial cumulative effect on biological resources.

Alternative 3: Former DHS Site

Due to the extent of past development, the Alternative 3 site and its immediate surroundings do not provide suitable habitat for special-status plant or animal species. No sensitive natural communities, special status species, wetlands, or important wildlife movement corridors occur in the vicinity (UC Berkeley 2009). Therefore, development of Alternative 3 would not contribute to cumulative effects to biological resources.

Alternative 4: Leased Facility on San Pablo Avenue

The Alternative 4 site consists of leasing and renovating an existing building in a densely developed urban area. The site is fully developed with a building, parking lot, and driveways and contains no natural vegetation that could support wildlife or special status plant species. The surrounding area is also similarly developed with urban uses and no natural habitat is present in the areas adjoining the site. Development of Alternative 4 would therefore not contribute to cumulative effects to biological resources.

Alternative 5: No Action

There would be no cumulative effects related to biological resources under this alternative.

6.2.5 Cultural Resources

Proposed Action

The affected environment for consideration of cumulative effects to historic and archaeological resources under the Proposed Action is the LBNL site and UC Berkeley.

Concerning potential cumulative effects on known or unknown archaeological resources, the vast majority of the LBNL and UC Berkeley projects involve sites that have been developed or disturbed in the past. Furthermore, in compliance with LBNL SPFs, all projects would be required to halt construction in the event that previously unknown archaeological resources are encountered during ground-disturbing activities. Therefore, cumulative effects on archaeological resources would be minimal.

Based on an evaluation of the age and other characteristics for determination of the significance of a historic structure, some buildings on the LBNL site and at the UC Berkeley campus are considered historic. A few of the projects could include alterations to or demolition of historic structures, including the SCIP and the Building 51 and Bevatron projects. However, construction activities related to the Proposed Action would not affect any buildings or structures that qualify as historic resources.

Alternative 1: Cafeteria Parking Lot Site

Cumulative effects related to cultural resources under this alternative would be similar to those under the Proposed Action.

Alternative 2: RFS Site

The Alternative 2 site does not contain any historic structures. Due to its proximity to the San Francisco Bay margins, there is potential to encounter archaeological resources in the portion of the Alternative 2 site that has not been previously excavated. However, adequate protections are provided as part of the alternative and by LBNL SPFs to minimize the potential effects of this alternative on archaeological resources. Therefore, cumulative effects on archaeological resources would be minimal.

Alternative 3: Former DHS Site

The potential to encounter archaeological resources at the Alternative 3 site is low given that the site is developed with an existing building and parking lots. Furthermore, UC Berkeley has evaluated the existing DHS building, to be removed by the Helios Energy Research Facility project, and determined that it is not a historic resource. Therefore, Alternative 3 would not contribute to the cumulative loss of cultural resources.

Alternative 4: Leased Facility on San Pablo Avenue

The building that would be altered under Alternative 4 is a potential historic resource at the state or federal level. Additional properties – both identified and unidentified – within this alternative's area of potential effect have been recommended by the Northwest Information Center for further exploration with the State Historic Preservation Office. Accordingly, there are additional resources in the vicinity that have the potential to pose cumulative indirect effects in concert with Alternative 4's proposed alterations to the potential historic resource at the San Pablo site. This alternative would not involve ground disturbance is previously undisturbed areas and, therefore, would not contribute to the cumulative loss of archaeological resources.

Alternative 5: No Action

There would be no cumulative effects related to cultural resources under this alternative.

6.2.6 Visual Resources

Proposed Action

The study area for consideration of cumulative effects to visual resources is the LBNL site, including lower-elevation viewsheds of the site.

Construction of cumulative projects would involve building sites on the LBNL site, UC Berkeley lands, and in the City of Berkeley. While there are no officially designated scenic vistas for the City of Berkeley, the City of Oakland, UC Berkeley, or LBNL, the Berkeley-Oakland hillside areas offer extensive views of the San Francisco Bay and present a scenic landscape from lower elevations. As discussed in **Section 5.6, Visual Resources**, the CRT facility would not be prominently visible from off-site locations and would appear as an incremental addition to the currently developed hillside. This potential impact of the Proposed Action would not cumulate with the impacts from other projects because the other projects currently proposed at LBNL, UC Berkeley, and in the City of Berkeley would not form part of the scenic views that contain the project site. Implementation of LBNL SPFs would minimize effects associated with light and glare. Therefore, cumulative effects to visual resources would be minimal under the Proposed Action.

Alternative 1: Cafeteria Parking Lot Site

As with the Proposed Action, development of the Alternative 1 site would be largely screened from off-site viewpoints by existing buildings, topography, and vegetation. Implementation of LBNL SPFs would minimize effects associated with light and glare. Therefore, cumulative effects to visual resources would be minimal under Alternative 1.

Alternative 2: RFS Site

Views of the proposed facility at the Alternative 2 site would be largely screened from public views from the Bay Trail and housing by intervening buildings and vegetation. The building would be adjacent to existing structures and would therefore appear as an incremental addition to the existing development at the RFS site. Therefore, cumulative effects to visual resources would be minimal under Alternative 2.

Alternative 3: Former DHS Site

The proposed facility would be constructed on a small portion of the existing DHS site footprint. Alternative 3 would likely improve the existing visual character of the site and the current visual conditions are poor. In addition, requirements under the UC Berkeley LRDP that include lighting design and visual character requirements would be implemented as part of this alternative. Therefore, Alternative 2 would not contribute to adverse cumulative effects to visual resources.

Alternative 4: Leased Facility on San Pablo Avenue

The construction of the additional computer floor at the Alternative 4 site would appear as an incremental addition to the industrial urban setting of the site. The addition would be small in comparison to the existing facility and the facility is in a largely industrial area; thus, construction would have a very minimal contribution to cumulative effects on the visual environment.

Alternative 5: No Action

There would be no cumulative effects related to aesthetics under this alternative.

6.2.7 Air Quality

Proposed Action

The study area for consideration of cumulative effects to air quality is the San Francisco Bay Area Air Basin (SFBAAB). However, various pollutants have different areas of spatial effect depending on their nature and sources. Bay Area Air Quality Management District (BAAQMD) guidelines have taken these factors into account in developing the criteria used as thresholds for cumulative impacts; projects that result in emissions or human health risks below these thresholds would not result in substantial adverse human health effects. Consistent with the BAAQMD guidelines, the study area for cumulative cancer and non-cancer risk effects is the proposed CRT facility, and the zone within the 1,000-foot radius from the Proposed Action site boundary. The only projects within 1,000 feet of the proposed CRT facility site would be within the LBNL site fence line. According to the BAAQMD, a project would have a cumulative considerable impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000-foot radius from the fence line of a source, or from the location of a receptor, plus the contribution from the project, exceeds the following:

- Non-compliance with a qualified risk reduction plan; or,
- An excess cancer risk levels of more than 100 in 1 million or a chronic or a non-cancer (i.e., chronic or acute) hazard index (from all local sources) greater than 1.0; or
- 0.8 $\mu g/m^3$ annual average fine particulate matter ($PM_{2.5}$)

Cumulative Construction Effects

Cumulative air quality impacts from construction/demolition activities associated with LBNL projects occurring over the same period, including the Proposed Action, were evaluated by Golder Associates consistent with the BAAQMD thresholds. This included:

- Cumulative lifetime excess cancer risk (LECR) and chronic hazard effect to off-site sensitive receptors from truck traffic associated with LBNL and UC Berkeley construction/demolition activities over the project period.
- Cumulative LECR and chronic hazard effect to on- and off-site sensitive receptors from on-site, off-road equipment emissions associated with LBNL and UC Berkeley construction/demolition activities over the project period.
- Cumulative $PM_{2.5}$ effect to off-site ambient air from truck traffic associated with LBNL and UC Berkeley construction/demolition activities over the project period.
- Cumulative $PM_{2.5}$ effect to off-site ambient air from on-site, off-road equipment emissions associated with LBNL and UC Berkeley construction/demolition activities over the project period.

For this assessment, diesel particulate matter (DPM) and $PM_{2.5}$ emissions from trucks and off-road equipment associated with all identified construction and demolition projects occurring over the Proposed Action period were estimated using methods and models identical to those used to estimate DPM and $PM_{2.5}$ emissions from these sources for the Proposed Action as described in **Section 5.7, Air Quality**. Identical dispersion modeling methods were then used to estimate maximum average DPM concentrations at potential sensitive receptor locations on and off site, and maximum average $PM_{2.5}$ concentrations in ambient air (defined as any off-site location).

LECR and chronic hazard for the hypothetical maximally exposed individual (MEI) were calculated using the same methods used to estimate these effects resulting from on-road truck and off-road equipment emissions from the Proposed Action alone. These results are provided in **Tables 6.0-2** and **6.0-3**.

Table 6.0-2
Cumulative MEI LECR and Chronic Hazard Estimates
for On-Site, Off-Road Construction/Demolition Equipment DPM Emissions

Assessment	MEI Result	Significance Threshold
Cumulative On-Site LECR	15-in-a-million	100-in-a-million
Cumulative On-Site Chronic Hazard	0.3	1.0
Cumulative Off-Site LECR	25-in-a-million	100-in-a-million
Cumulative Off-Site Chronic Hazard	0.06	1.0

Source: Golder Associates, January 2010

Table 6.0-3
Cumulative MEI LECR and Chronic Hazard Estimates
for Construction/Demolition Truck Traffic

Assessment	MEI Result	Significance Threshold
Cumulative Off-Site LECR	9-in-a-million	100-in-a-million
Cumulative Off-Site Chronic Hazard	0.02	1.0

Source: Golder Associates, January 2010

Maximum cumulative $PM_{2.5}$ concentrations in ambient air (i.e., any off-site location) were also determined using dispersion modeling methods identical to those used to determine $PM_{2.5}$ effects from the Proposed Action. These results are provided in **Table 6.0-4**. Based on these estimates, the cumulative LECR, chronic hazard, and $PM_{2.5}$ impacts would not exceed the recommended BAAQMD thresholds.

Table 6.0-4
Cumulative Maximum Estimated Annual $PM_{2.5}$ Concentration in Ambient Air from Construction/Demolition Emissions

Pollutant	Assessment	Maximum Ambient Concentration	Significance Threshold
$PM_{2.5}$	On-Site, Off-Road Equipment Emissions	0.31 μg/m³	0.8 μg/m³
$PM_{2.5}$	Off-Site, On-Road Truck Emissions	0.07 μg/m³	0.8 μg/m³

Source: Golder Associates, January 2010

Cumulative Operational Effects

As described in **Section 5.7, Air Quality**, the maximum LECR effects from Proposed Action operation would be relatively small (0.4 in 1 million within the LBNL site property boundary and 0.4-in-a-million outside of the boundary). The LBNL 2006 LRDP EIR found that cumulative emissions of toxic air contaminants associated with the 2006 LRDP (including the Proposed Action) combined with toxic air contaminant emissions from sources on the UC Berkeley campus under the UC Berkeley 2020 LRDP over the LRDP period out to 2025, would result in a maximum LECR of 22 in 1 million. Although the Proposed Action is part of the growth projected under the 2006 LRDP and is therefore already accounted for in the LBNL sitewide LECR assessment, conservatively adding the maximum LECR for the proposed project (0.4 in 1 million) to the maximum cumulative LECR from the LRDP cumulative analysis (22 in 1 million) would provide a result of no more than 22.4 in 1 million. This is less than the BAAQMD threshold of 100 in 1 million (for either construction or operation) for assessing cumulative LECR, and adopted for use in this EA. Note that a risk of 22 in 1 million is estimated under 2025 conditions. It would be lower in 2018 as only a fraction of the LBNL growth would be in place by that year.

Alternative 1: Cafeteria Parking Lot Site

Cumulative effects related to air quality would be similar to the Proposed Action under this alternative.

Alternative 2: RFS Site

Cumulative effects related to air quality would be similar to the Proposed Action under this alternative, as it would result in the same emissions from construction traffic and equipment and from operational stationary and area sources. There are no cumulative projects in the vicinity of the RFS site.

Alternative 3: Former DHS Site

Construction of four UC Berkeley projects (Warren Hall Replacement/Li Ka Shing Center, Community Health Campus Phase 1, DHS Demolition/Helios, and Berkeley Art Museum/PFA) would occur within 300 meters (approximately 1,000 feet) of and concurrently with the CRT facility at the former DHS site. Cumulative effects related to air quality would be similar to the Proposed Action under this alternative as construction activities would be comparable and operation would result in the same stationary and area source emissions.

Alternative 4: Leased Facility on San Pablo Avenue

Cumulative effects related to air quality would be less than the Proposed Action under this alternative as construction activities would be limited to expansion of an existing building. However, operation of Alternative 4 would result in the same contribution to stationary and area source emissions as the Proposed Action.

Alternative 5: No Action

There would be no cumulative effects related to air quality under this alternative.

6.2.8 Greenhouse Gases

The discussion of greenhouse gas (GHG) emissions presented in **Section 5.8, Greenhouse Gases**, is already a cumulative-level discussion because project-related emissions are considered in relation to other existing emissions to evaluate the contribution to global climate change.

6.2.9 Noise

Proposed Action

The study area for consideration of the cumulative effects of noise is the areas immediately surrounding the Proposed Action site that would be affected by noise from project construction and operation and along the truck route through the city of Berkeley that would experience Proposed Action-related construction truck traffic.

Cumulative Construction Noise

Based on the construction schedules of the cumulative projects listed in **Table 6.0-1**, it is anticipated that construction will be underway on numerous other projects at the LBNL site, UC Berkeley, and in the city of Berkeley at the same time, the CRT facility is under construction. As discussed in **Section 5.9, Noise**, construction noise levels would not substantially exceed existing hourly average noise levels for the nearest sensitive receptors and would fall within the range of existing traffic noise levels in the area. Due to the distance between the project site and the sites of most of the other LBNL projects, noise from CRT construction activities would not cumulate with noise resulting at the nearest receptors from the construction at other project sites.

Cumulative construction truck traffic associated with the projects listed in **Table 6.0-1** was analyzed to determine whether or not it would cause a substantial temporary increase in noise along the major arterials—namely, Hearst Avenue, Oxford Street, and University Avenue—that would be used by the construction trucks associated with the Proposed Action. To demonstrate a worst-case scenario, assuming all projects were under construction concurrently and all construction truck traffic traveled along the same arterials, calculations indicate that on an average day the noise level would increase by less than 1 dB(A) day/night noise (L_{dn}). On a peak day, the noise level is calculated to increase from about 1 to 2 dB(A) L_{dn}. A noise level increase of 3 dB(A) is generally regarded as the minimum increase that is perceptible to the average human and has been used as a standard in this EA to evaluate impacts in areas where the ambient or background noise levels without the project are close to or exceed the California Office of Planning and Research noise/land use compatibility standard for affected land uses. As an increase of less than 3 dB(A) L_{dn} would not be considered substantial, the cumulative noise effect from construction truck traffic to, from, or within the LBNL site would be minimal (US Department of Transportation 1980). Even if vehicle trips associated with CRT project construction workers traveling to and from the site were added to the cumulative construction truck traffic, the resultant noise from this traffic would not exceed 3 dB(A) L_{dn}.

Cumulative Operational Noise

Operational noise from the CRT facility and other LBNL and UC Berkeley projects would not have a substantial effect on community noise levels because other projects in the vicinity listed under **Table 6.0-1** would be sufficiently far from the CRT facility and the nearest off-site sensitive receptors so as not to cumulate substantially. As discussed in **Section 5.9**, the calculated noise level from the cooling towers is 43 to 44 dB(A) at the nearest sensitive receptors.

With respect to CRT-related daily vehicle trips, the analysis in **Section 5.9** showed that the CRT traffic when combined with 2018 background traffic (which includes traffic from other cumulative projects) would not make a noticeable change (less than 0.5 dB(A) L_{dn}) at any of the roadway segments studied.

Alternative 1: Cafeteria Parking Lot Site

Noise generated by development of Alternative 1 would be similar to the Proposed Action but would result in a lesser cumulative noise effect compared to the Proposed Action, as it would be located further from off-site sensitive receptors.

Alternative 2: RFS Site

Noise generated by development of Alternative 2 would be similar to the Proposed Action but would result in a lesser cumulative noise effect compared to the Proposed Action, as it would be located further from off-site sensitive receptors.

Alternative 3: Former DHS Site

Despite implementation of construction-period noise controls, construction of Alternative 3 would generate noise at a level that would exceed the threshold set by the local ordinance at the 1901 Oxford Street apartments, which are on the same city block as the CRT facility. Alternative 3 would therefore have an adverse effect on cumulative noise levels.

Alternative 4: Leased Facility on San Pablo Avenue

Construction-period noise controls would reduce the noise levels for Alternative 4 but would not necessarily bring them below the 65 dB(A) level, which is the maximum allowable receiving noise level for residential uses according to the City of Oakland's noise ordinance, at the nearest residential receptor. The contribution of operational noise from Alternative 4 would not exceed thresholds in the vicinity of the facility as mechanical equipment would be shielded and the small increase in traffic would not result in a perceptible increase in noise as it takes a doubling of traffic to result in a 3 dB(A) increase, which is generally regarded as the minimum increase that is perceptible to the average human. Therefore, Alternative 4 would have a minor effect on cumulative noise levels.

Alternative 5: No Action

There would be no cumulative effects related to noise under this alternative.

6.2.10 Transportation and Traffic

Proposed Action

The study area for consideration of the cumulative effects to transportation and traffic is the truck route between the construction site and the freeway that would be used by construction trucks, and the major arterials leading to the LBNL site that would be affected by the Proposed Action-related operational traffic.

Cumulative Construction Traffic

The construction of the CRT facility could coincide with construction of other LBNL and UC Berkeley projects as listed in **Table 6.0-1.** The cumulative traffic volumes with and without construction of the CRT facility are shown in **Figure 6.0-2, Cumulative No CRT Conditions – Peak Hour Traffic Volumes** and **Figure 6.0-3, Cumulative with CRT Conditions – Peak Hour Traffic Volumes.** Typically, each project would generate the greatest number of truck trips during the excavation phase of construction. It is extremely unlikely that all these projects would be under construction and in the excavation phase simultaneously. However, there may be temporary peaks of excavation-related activity and other truck activity that would affect vehicle circulation near the project sites and on truck routes within the city, and the cumulative effect during those periods could be potentially substantial. Pursuant to LRDP Best Practice TRANS-6a, which is also included in the Proposed Action, UC LBNL will meet and coordinate with UC Berkeley and City of Berkeley to schedule the construction of various projects to minimize roadway closures, overlap of excavation, and other heavy truck activity periods, plus minimize the combined effects of construction activity on vehicle, bicycle, and pedestrian circulation and parking. Furthermore, pursuant to LBNL 2006 LRDP Best Practice TRANS-6c, which requires LBNL to manage project construction schedules to minimize the combined effects of project construction within LBNL, UC LBNL has established a program to limit the total construction truck movement to 98 one-way trips. Under this program, the UC LBNL Site Construction Coordinator oversees and controls all construction activities, including traffic. Through the development, implementation and coordination of project-specific traffic control plans as well as the management of concurrent project schedules so as to minimize the overlap of excavation or other heavy truck activity, the Site Construction Coordinator regulates and maintains construction traffic below a daily average of 98 one-way trips. By itself, construction under the Proposed Action is not expected to generate more than a maximum daily average of 13 one-way truck trips at any time, and in combination with other projects at LBNL construction under the Proposed Action would not generate a daily average of more than 98 one-way trips even at the peak of construction activities in June through October 2012. Nonetheless, the Site Construction Coordinator will ensure that the total construction truck traffic associated with the Proposed Action combined with trucks associated with other ongoing construction projects at the LBNL site does not exceed the volumes established to avoid a substantial traffic impact along the truck route.

Cumulative Operational Traffic

The analysis of near-term (2018) impacts presented in **Section 5.10, Transportation and Traffic**, represents a cumulative analysis as it takes into account operational traffic that would be generated by the Proposed Action as well as other reasonably foreseeable projects through 2018. As that analysis shows, the Proposed Action's traffic when combined with other existing and projected traffic would not cause the study intersection levels of service to exceed the City's significance thresholds.

Other Traffic Effects

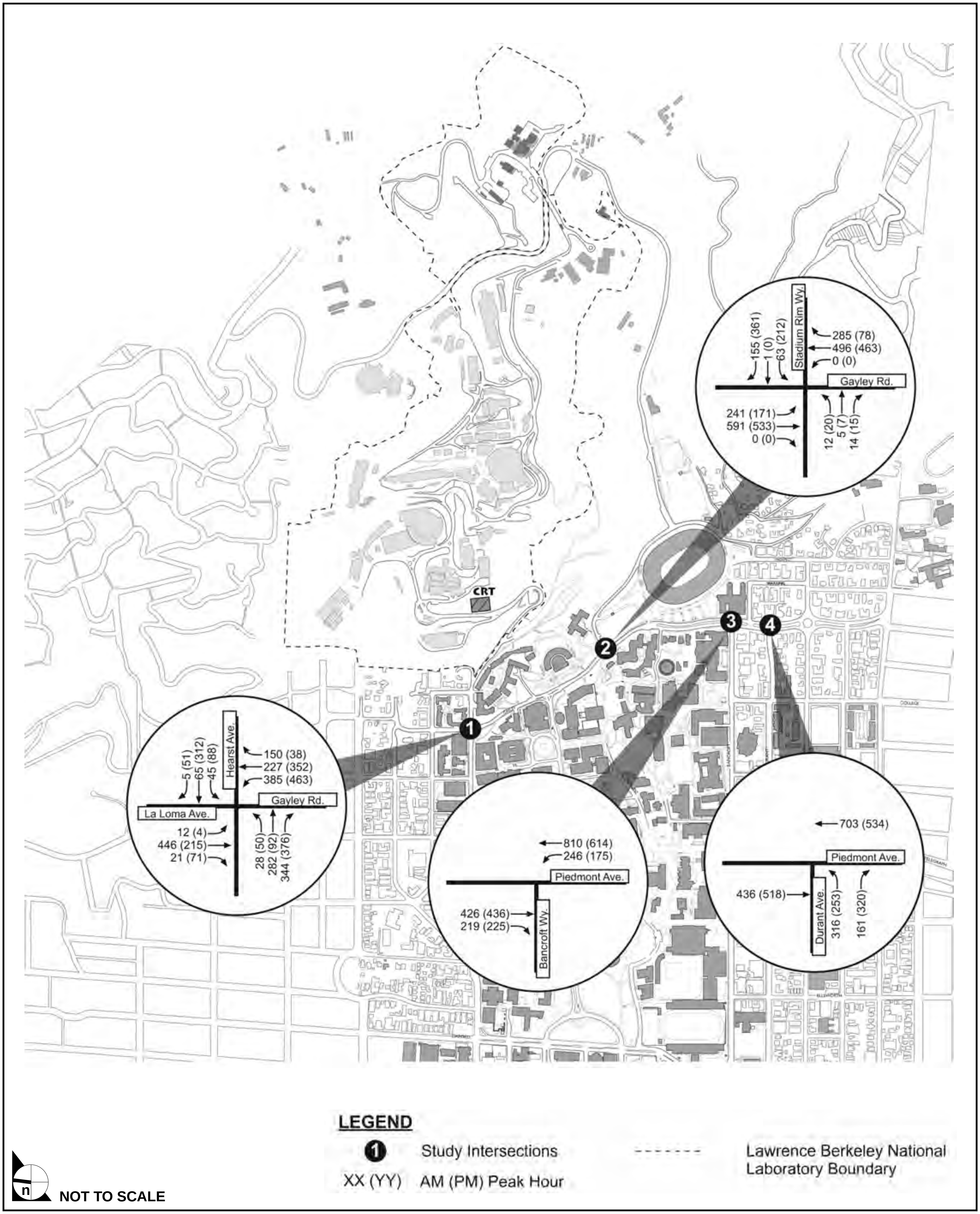
Parking demand generated by the CRT facility combined with parking demand generated by other planned LBNL projects could potentially exceed the parking supply at LBNL. However, the ongoing transportation demand management program proposed as part of LBNL SPFs (SPF TRANS-1d, which would be implemented as part of the project), would reduce the cumulative effect on parking within the LBNL site.

Alternative 1: Cafeteria Parking Lot Site

The cumulative traffic effects of Alternative 1 would be similar to those for the Proposed Action.

Alternative 2: RFS Site

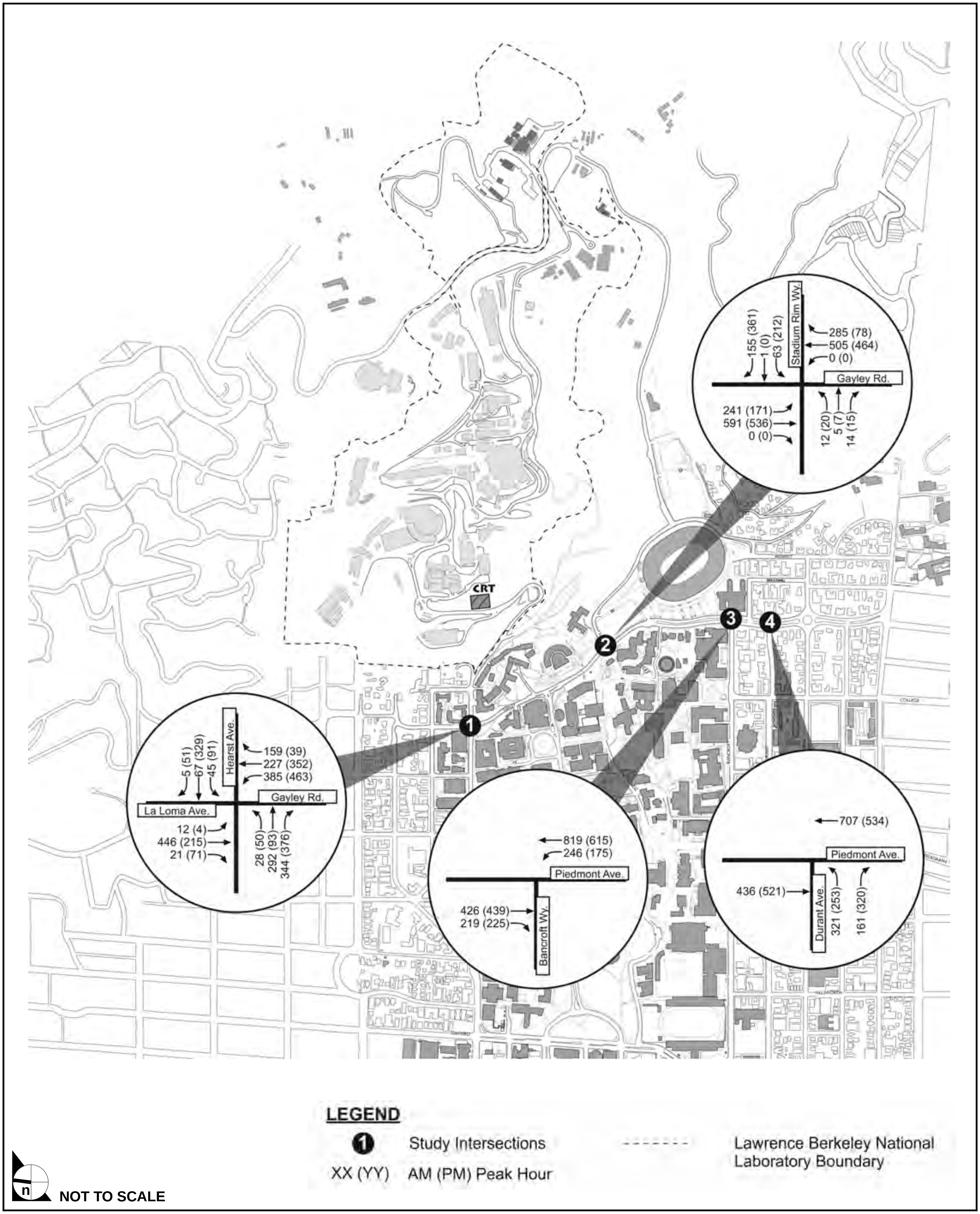
The discussion of transportation and traffic for Alternative 2 presented in **Section 5.10, Transportation and Traffic**, is a cumulative-level discussion because project-related vehicle trips are considered in relation to traffic at area roadways and intersections.



SOURCE: Fehr & Peers Transportation Consultants – January 2010

FIGURE **6.0-2**

Cumulative No CRT Conditions – Peak Hour Traffic Volumes



SOURCE: Fehr & Peers Transportation Consultants – January 2010

FIGURE **6.0-3**

Cumulative with CRT Conditions – Peak Hour Traffic Volumes

924-006•02/10

Alternative 3: Former DHS Site

The discussion of transportation and traffic for Alternative 3 presented in **Section 5.10, Transportation and Traffic**, is a cumulative-level discussion because project-related vehicle trips are considered in relation to traffic at area roadways and intersections.

Alternative 4: Leased Facility on San Pablo Avenue

The discussion of transportation and traffic for Alternative 4 presented in **Section 5.10, Transportation and Traffic**, is a cumulative-level discussion because project-related vehicle trips are considered in relation to traffic at area roadways and intersections.

Alternative 5: No Action

There would be no cumulative effects related to traffic and transportation under this alternative.

6.2.11 Utilities and Waste Management

Proposed Action

The study area for consideration of the cumulative effects to utilities and waste management is the existing utility infrastructure that serves the Proposed Action.

Development of the CRT facility would not result in substantial effects on utilities and waste management as discussed in **Section 5.11, Utilities and Waste Management**. However, the Proposed Action, in conjunction with other LBNL and UC Berkeley projects listed in **Table 6.0-1**, could result in increases in demand for utilities.

EBMUD provides water and wastewater treatment services to LBNL, UC Berkeley, and the cities of Berkeley and Oakland. As discussed in **Section 5.11,** there is sufficient treatment capacity at EBMUD's wastewater treatment plant to accommodate the wastewater associated with the Proposed Action. EBMUD has also indicated that it can provide the additional volume of water needed to serve the incremental growth at LBNL from its existing supply sources (LBNL 2008). Therefore, the Proposed Action, in conjunction with other projects at the LBNL site, would not result in a demand for water that would require EBMUD to develop new water supply sources. Furthermore, no improvements to water supply mains are necessary to serve the CRT facility or the cumulative projects at LBNL.

Other LBNL and UC Berkeley projects through 2018 could incrementally increase the demand for utilities, including gas and electricity. However, these projects would occur within a largely built-out urban area where utility systems generally are provided. Additionally, the increases in demand attributed to other development projects are addressed on a site-by-site basis by the service providers prior to approval of new development.

Alternative 1: Cafeteria Parking Lot Site

Cumulative effects related to utilities and waste management would be similar to the Proposed Action under this alternative.

Alternative 2: RFS Site

Similar to the Proposed Action, Alternative 2 would be located in a largely developed area currently served by sufficient utilities and service systems to accommodate projects through 2018. This alternative would contribute to the need for improvements to the electrical distribution system and a substation; however, as discussed in **Section 5.0**, improvements would occur in previously disturbed portions of the RFS site where sensitive biological or intact cultural resources are unlikely to occur. Therefore the development of the proposed building or related infrastructure under this alternative would not contribute to cumulative environmental effects.

Alternative 3: Former DHS Site

Similar to the Proposed Action, Alternative 3 would be located in a largely developed area currently served by sufficient utilities and service systems to accommodate projects through 2018, as documented in the UC Berkeley 2020 LRDP EIR. This alternative would contribute to the need for improvements to the electrical distribution system and a substation; however, improvements would occur in previously disturbed portions of the former DHS site where sensitive biological or intact cultural resources are unlikely to occur. Therefore the development of the proposed building or related infrastructure under this alternative would not contribute to cumulative environmental effects.

Alternative 4: Leased Facility on San Pablo Avenue

Similar to the Proposed Action, Alternative 3 would be located in a largely developed area currently served by sufficient utilities and service systems to accommodate projects through 2018. This alternative would contribute to the need for improvements to the electrical distribution system and a substation; however, improvements would be constructed within city streets and on the 6701 San Pablo Avenue site – environments that have been previously disturbed where sensitive biological or intact cultural resources are unlikely to occur. Therefore, the development of the proposed building or related infrastructure under this alternative would not contribute to cumulative environmental effects.

Alternative 5: No Action

There would be no cumulative effects related to utilities and waste management under this alternative.

6.2.12 Public Services

Proposed Action

The study area for consideration of the cumulative effects to public services is the service area of the local police and fire protection services serving the Proposed Action.

Implementation of the Proposed Action would contribute to an increase in demand for fire protection services and police services. However, as discussed in **Section 5.12, Public Services**, this increased demand would not result in the need for new or physically altered facilities.

Other LBNL and UC Berkeley projects would incrementally increase demand for fire protection and police services, which could contribute to the need for new or altered fire protection or police facilities in the region. The City of Berkeley General Plan indicates the need for additional fire protection facilities, and the City of Oakland General Plan indicates the need for expanded facilities or the seismic retrofit of existing facilities. However, implementation of the Proposed Action and other projects through 2018 would add approximately 300 people to the LBNL site on a daily basis. This increase in population would not result in the need for new facilities, staff, or equipment to provide adequate fire protection or police services.

Alternative 1: Cafeteria Parking Lot Site

Cumulative effects related to public services would be similar to the Proposed Action under this alternative.

Alternative 2: RFS Site

Implementation of Alternative 2 would contribute to an increase in demand for fire protection services and police services. However, as discussed in **Section 5.12, Public Services**, this increased demand would not result in the need for new or physically altered facilities.

Alternative 3: Former DHS Site

Implementation of Alternative 3 would contribute to an increase in demand for fire protection services and police services. However, as discussed in **Section 5.12, Public Services**, this increased demand would not result in the need for new or physically altered facilities.

Alternative 4: Leased Facility on San Pablo Avenue

The facility to be leased on San Pablo Avenue under Alternative 4 is already served by existing public service providers and would not contribute to a cumulative effect on public services.

Alternative 5: No Action

There would be no cumulative effects related to public services under this alternative.

6.2.13 Population and Housing, Socioeconomic and Environmental Justice

Proposed Action

LBNL is one of the largest employers in Berkeley, and most LBNL employees live in Berkeley or the immediate vicinity. Accordingly, growth in Berkeley (including at UC Berkeley) is the focus of the cumulative analysis for the Proposed Action.

Increases in population growth and housing demand associated with the implementation of the Proposed Action would be minimal, as operation of the CRT facility would involve hiring or relocating only 15 new staff and the relocation of 70 staff from the OSF in Oakland. The remainder of the CRT population already works at LBNL or at UC Berkeley. In addition to the population growth assumed for the Proposed Action, other LBNL projects through 2018 would contribute to existing population and housing totals, although several LBNL projects would just demolish old buildings and not construct new building space. However, the growth would be accommodated throughout the San Francisco Bay Area through new development and through changes in the occupancy rates and use of existing residential and other building space.

Implementation of the UC Berkeley projects proposed during the Proposed Action time frame could result in an increase in faculty and staff working in the Campus Park area and adjacent blocks and an increase in students. Many students, faculty, and staff prefer to live close to the campus and within the City of Berkeley. The Anna Head Housing project, scheduled to be completed in mid-2012, and the Ellsworth Student Housing project, scheduled to be completed in 2017, would add approximately 890 beds within 1 mile of the center of the campus.

Therefore, the employment and enrollment growth associated with the UC Berkeley and LBNL projects through 2018, including the Proposed Action, would not represent substantial population growth. This increase represents a minimal cumulative effect for population and housing.

As discussed in **Section 5.13, Population and Housing, Socioeconomics, and Environmental Justice**, the Proposed Action would not result in environmental effects or human health risks that could affect minority and low-income populations in the surrounding area. Therefore, it would not contribute to a cumulative effect.

Alternative 1: Cafeteria Parking Lot Site

Cumulative effects related to population and housing, socioeconomics, and environmental justice under this alternative would be similar to the Proposed Action.

Alternative 2: RFS Site

As discussed in **Section 5.13, Population and Housing, Socioeconomics, and Environmental Justice,** development of Alternative 2 would be similar to the Proposed Action and would not result in environmental effects or human health risks that could affect minority and low-income populations in the surrounding area. Therefore, it would not contribute to a cumulative effect.

Alternative 3: Former DHS Site

Construction activities in the vicinity of the Alternative 3 site would take place in the same timeframe as the Proposed Action. As discussed in **Section 5.13, Population and Housing, Socioeconomics, and Environmental Justice,** the development of Alternative 3 would be similar to the Proposed Action and would not result in environmental effects or human health risks that could affect minority and low-income populations in the surrounding area. Therefore, it would not contribute to a cumulative effect.

Alternative 4: Leased Facility on San Pablo Avenue

As indicated in the City of Berkeley and City of Oakland cumulative project lists, there are no projects proposed in the vicinity of the Alternative 4 site that would be constructed in the same timeframe as the Proposed Action. As discussed in **Section 5.13, Population and Housing, Socioeconomics, and Environmental Justice,** the development of Alternative 3 would be similar to the Proposed Action and would not result in environmental effects or human health risks that could affect minority and low-income populations in the surrounding area. Therefore, it would not contribute to a cumulative effect.

Alternative 5: No Action

There would be no cumulative effects related to population and housing and socioeconomic and environmental justice under this alternative.

6.2.14 Construction Traffic Accidents

Proposed Action

As discussed in **subsection 6.2.10, Transportation and Traffic,** construction traffic to the LBNL site is controlled and overseen by the UC LBNL Site Construction Coordinator. The coordinator ensures that truck movement for construction within the lab is limited to 98 one-way trips. Although background traffic is expected to increase on city streets, construction of the Proposed Action in combination with other construction projects at the LBNL site would not result in a considerable increase in construction truck traffic as truck trips would be controlled and therefore no corresponding increase in potential for traffic accidents compared to existing conditions as a result of LBNL projects. The project's contribution to the potential for increased traffic accidents would be minimized.

Alternative 1, Cafeteria Parking Lot Site

The potential for truck collisions during construction of Alternative 1 in addition to other construction projects at the LBNL site would be similar to those described above for the Proposed Action.

Alternative 2, RFS Site

Construction traffic associated with construction at the RFS site would not elevate the risk for traffic accidents because the freeway is close by and the affected intersection currently operates at an acceptable level. There would be no other construction projects in the vicinity of the Alternative 2 site. Therefore, the cumulative risk of traffic accidents related to construction traffic would be minimal.

Alternative 3, Former DHS Site

Trucks from the Alternative 3 site and surrounding development would follow the same route as the Proposed Action. Therefore, the potential for collisions from construction trucks would be similar. As explained in **subsection 6.2.14,** this potential cumulative risk would be minimal.

Alternative 4, Leased Facility on San Pablo Avenue

Construction at the Alternative 4 site, in combination with other construction projects in the vicinity of the site in the Cities of Berkeley, Oakland, and Emeryville would add truck traffic to San Pablo Avenue and Ashby. The increase of construction traffic on these streets could increase the potential for construction truck accidents. However, given the limited number of trucks needed for construction of this alternative, the contribution to the total cumulative risk would be minimal.

Alternative 5, No Action

There would be no construction associated with the No Action alternative. Therefore, there would be no cumulative effects related construction traffic accidents under this alternative.

7.0 ACRONYMS AND ABBREVIATIONS

μg/m^3	micrograms per cubic meter
AB	Assembly Bill
ABAG	Association of Bay Area Governments. The regional planning agency in the San Francisco Bay area working to help solve problems in areas such as land use, housing, environmental quality, and economic development.
ACFD	Alameda County Fire Department
AC Transit	Alameda-Contra Costa Transit
ADA	Americans with Disabilities Act
ADP	Adjusted Daily Population
ADT	Average Daily Traffic
ALUC	Airport Land Use Commission
ANSI	American National Standards Institute
APCD	Air Pollution Control District
ASCR	Advanced Scientific Computing Research
asf	assignable square feet
ASF	age sensitivity factor
ASTM	American Society for Testing and Materials
ATCM	Airborne Toxics Control Measure
BAAQMD	Bay Area Air Quality Management District. A nine-county regional air district created under the provisions of the California Health and Safety Code Section 40200. It consists of nine member counties: all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, and the southern portions of Solano and Sonoma counties. The BAAQMD is responsible for the developing the overall attainment strategy for its respective geographic area (see SFBAAB below) and has the authority to regulate stationary sources, some area sources, and some aspects of mobile sources.
BACT	Best Available Control Technology
BART	Bay Area Rapid Transit

Bay Area	San Francisco Bay Area
BCDC	San Francisco Bay Conservation and Development Commission
BCT	Best Conventional Pollutant Control Technology
Bear Transit	UC Berkeley Shuttle Service
BELLA	Berkeley Lab Laser Accelerator
BFD	Berkeley Fire Department
bgs	below ground surface
BMPs	best management practices
BRT	Bus Rapid Transit
BSL	Biosafety Level
BTU	British thermal unit
BUSD	Berkeley Unified School District
C_2H_3Cl	vinyl chloride
CAA	Clean Air Act. The federal air pollution control statute first passed in 1963, following a 1955 federal statute authorizing research and technical assistance. The 1965 and 1967 amendments began automobile and stationary source standards. The most recent amendments of the CAA were passed in 1990.
CAAQS	California Ambient Air Quality Standards
CAP	Clean Air Plan
CARB	California Air Resources Board. The state's lead air quality agency consisting of an 11-member board appointed by the Governor. CARB is responsible for attainment and maintenance of the state and federal air quality standards, and is fully responsible for motor vehicle pollution control. It oversees county and regional air pollution management programs.

Cal/EPA	California Environmental Protection Agency. The state agency established in 1991 for unifying environmental activities related to public health protection in the State of California. The Cal/EPA boards, departments, and offices are directly responsible for implementing California environmental laws, or play a cooperative role with other regulatory agencies at regional, local, state, and federal levels. There are six boards, departments, and offices under the organization of Cal/EPA including the California Air Resources Board (ARB), California Integrated Waste Management Board (IWMB), State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCB), Department of Pesticide Regulation (DPR), Department of Toxic Substances Control (DTSC), and Office of Environmental Health Hazard Assessment (OEHHA).
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CBC	California Building Code
CCAA	California Clean Air Act. The state law that was passed in 1988 to provide the basis for air quality planning and regulation independent of federal regulations. A major element of the CCAA is the requirement that local air districts in violation of the CAAQS must prepare attainment plans that identify air quality problems, causes, trends, and actions to be taken to attain and maintain California's air quality standards by the earliest practicable date.
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDMG	California Division of Mines and Geology
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Responsibility, Compensation, and Liability Act
CESA	California Endangered Species Act
CFCs	chlorofluorocarbons
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	methane

CHP	California Highway Patrol
CIWMB	California Integrated Waste Management Board
CMP	Congestion Management Plan
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CRD	Computational Research Division
CRT	Computational Research and Theory
CSE	Computational Science and Engineering
CTMP	Construction Traffic Management Plan
CTR	California Toxics Rule
CUPA	Certified Unified Program Agency
CVC	California Vehicle Code
CWA	Clean Water Act
cy	cubic yard
dB	decibels
dBA	A-weighted decibels (Level of Noise Measurement)
DHS	Department of Health Services (California)
DOE	United States Department of Energy
DOE SC	United State Department of Energy Office of Science
DOT	Department of Transportation
DPM	diesel particulate matter

DTSC	Department of Toxic Substances Control (California)
DWR	Department of Water Resources (California)
EA	Environmental Assessment
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Park District
EH&S	LBNL Environment, Health, and Safety (Division)
EIR	Environmental Impact Report
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Environmentally Sensitive Area
ESL	Environmental Screening Level
ESnet	Energy Sciences Network
FAA	Federal Aviation Administration
FDA	United States Food and Drug Administration
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FTE	full-time equivalent
g/hp-hr	grams per horsepower hour
GHGs	greenhouse gases
GMMP	Groundwater Monitoring and Management Plan
gpd	gallons per day
GPL	General Purpose Laboratory
GSA	General Services Administration

gsf	gross square feet
GWP	Global Warming Potential
H_2O	water vapor
H_2S	hydrogen sulfide
HAP	Hazardous Air Pollutant. Chemicals that cause serious health and environmental effects. Health effects include cancer, birth defects, nervous system problems, and death due to massive accidental releases. Hazardous air pollutants are released by sources such as chemical plants, dry cleaners, printing plants, and motor vehicles (cars, trucks, buses, etc.).
HCFCs	hydrochlorofluorocarbons
HCM	Highway Capacity Manual
HFCs	hydrofluorocarbons
HHRA	Human Health Risk Assessment
HMMP	Hazardous Materials Management Plan
HMP	Hydrograph Modification Management Plan
HPC	high-performance computing
HOV	high-occupancy vehicle
HVAC	heating, ventilation, and air conditioning
HWHF	Hazardous Waste Handling Facility
Hz	Hertz
IPCC	Intergovernmental Panel on Climate Change
ISM	Integrated Safety Management
ITE	Institute of Traffic Engineers
kv	kilovolts
kVA	kilovolt (annual)
kW	kilowatts
lb/day	pounds per day

LBNL	Lawrence Berkeley National Laboratory
LCFS	Low Carbon Fuel Standards
LECR	lifetime excess cancer risk
LEED	Leadership in Energy and Environmental Design
L_{10}	noise level exceeded 10 percent of the time
L_{90}	noise level exceeded 90 percent of the time
L_{dn}	measured day/night average noise level
L_{eq}	energy-equivalent noise level
L_{max}	instantaneous maximum noise level
LHS	Lawrence Hall of Science
LOS	level of service
LRDP	Long Range Development Plan
LUST	leaking underground storage tank
M&O	Management and Operating
MEI	maximally exposed individual
MEPP	Master Emergency Program Plan
mgd	million gallons per day
mgy	million gallons per year
MMBtu	million British thermal units
$MMTCO_2e$	CO_2-equivalent million metric tons
MOA	Memorandum of Agreement
mph	miles per hour
MPO	Metropolitan Planning Organization
MS4s	Municipal Separate Storm Sewer Systems
MSL	Mean Sea Level

MTC	Metropolitan Transportation Commission
$MTCO_2e$	CO_2-equivalent metric tons
MVA	megavolt-amperes
MW	megawatts
MWh	megawatt hours
N-ZEB	Net-Zero Energy Buildings
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
National Register	National Register of Historic Places
NEPA	National Environmental Policy Act
NERSC	National Energy Research Scientific Computing Center
NIMS	National Incident Management System
NIOSH	National Institute for Occupational Safety and Health
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
NOI	Notice of Intent
NOx	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRCS	Natural Resource Conservation Service
NTIG	Nanotechnology Interest Group
NZEB	Net Zero Energy Building
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment (California)
OSCAR	Open Space, Conservation, and Recreation

OSF	Oakland Scientific Facility
OSHA	Occupational Safety & Health Administration
OUSD	Oakland Unified School District
Pb	lead
PCBs	polychlorinated biphenyls
PFCs	perfluorocarbons
PG&E	Pacific Gas & Electric Company
PM	particulate matter
$PM_{2.5}$	respirable particulate matter – 2.5 microns or smaller
PM_{10}	fine particulate matter – 10 microns or smaller
POC	precursor organic compounds
ppb	parts per billion
ppd	pounds per day
PPE	Personal Protective Equipment
pphm	parts per hundred million
ppm	parts per million
PRC	Public Resources Code
psi	pounds per square inch
psig	pounds per square inch gauge
RCRA	Resource Conservation and Recovery Act
RFS	Richmond Field Station
ROG	reactive organic gas
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCH	California State Clearinghouse

SCIP	Southwest Campus Integrated Projects
SCM	Smith-Corona Marchant Corporation
SERC	Solar Energy Research Center
sf	square feet
SF_6	sulfur hexafluoride
SFBAAB or Basin	San Francisco Bay Area Air Basin
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
SHMA	Seismic Hazards Mapping Act
SIP	State Implementation Plan
SLM	sound-level meter
SLR	single-lens reflex
SMP	Soil Management Plan
SO_2	sulfur dioxide
SO_4	sulfates
SO_x	sulfur oxide
SPCC	Spill Prevention Control and Countermeasure
SPF	Standard Project Feature
SR	State Route
State Register	California Register of Historical Resources
SWMP	Storm Water Monitoring Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TBACT	Best Available Control Technology for Toxics
TCM	Transportation Control Measure

TDM	Transportation Demand Management
The Regents	The Board of Regents of the University of California
The University	University of California
TIA	Traffic Impact Analysis
TLV	threshold limit value
TMDL	total maximum daily load
TOC	total organic carbon
TPH-g	total petroleum hydrocarbons as gasoline
TSCA	Toxic Substances Control Act
TSS	total suspended solids
UBC	Uniform Building Code
UC	University of California
UC Berkeley	University of California, Berkeley
UCOP	University of California, Office of the President
UCPD	UC Berkeley Police Department
UNFCCC	United Nations Framework Convention on Climate Change
URBEMIS	Air Quality Modeling Software
URF	unit risk factor
USACE	United States Army Corps of Engineers
US EPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tank
UV	ultraviolet
UWMP	Urban Water Management Plan

V	volts
VMT	vehicle-miles traveled
VOCs	volatile organic compounds
WAPA	Western Area Power Administration
WGCEP	Working Group on California Earthquake Probabilities

8.0 AGENCIES CONSULTED

8.1 AGENCIES CONSULTED

- Bay Area Air Quality Management District
- East Bay Municipal Utility District
- California State Office of Historic Preservation
- U.S. Fish and Wildlife Service

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APPENDIX 1

Standard Project Features

Introduction to Standard Project Features

Standard Project Features (SPFs) were originally identified in the UC LBNL 2006 LRDP EIR as environmentally proactive measures that would be incorporated into all LBNL projects. These measures have been adopted as part of the LBNL 2006 LRDP EIR by the Regents of the University of California. Because the proposed CRT facility is an element of the LBNL site growth projected by the University, the following SPFs are included in and a part of the Proposed Action and alternatives (described in **Section 3.0, Proposed Action and Alternatives**), except the Former DHS Site Alternative to which similar SPFs adopted by the UC Berkeley campus would apply.

For clarity, this Appendix lists SPFs as they were characterized in the 2006 LDRP EIR in Chapter 5, entitled *Mitigation Monitoring and Reporting Program*. These SPFs are pertinent to such environmental resource areas as aesthetics; air quality; biological resources; cultural resources; geology and soils; hazards and hazardous materials; hydrology and water quality; noise; traffic and transportation; and utilities and service systems. The analysis presented in the Environmental Assessment evaluates environmental impacts that would result from project implementation following the application of these SPFs.

SPF GEO-3a: Construction under the LRDP shall be required to use construction best management practices and standards to control and reduce erosion. These measures could include, but are not limited to, restricting grading to the dry season, protecting all finished graded slopes from erosion using such techniques as erosion control matting (manufactured with coconut fibers or similar products) and hydroseeding or other suitable measures.

SPF GEO-3b: Revegetation of areas disturbed by construction activities, including slope stabilization sites, using native shrubs, trees, and grasses, shall be included as part of all new projects.

SPF BIO-3: Direct disturbance, including tree and shrub removal or nest destruction by any other means, or indirect disturbance (e.g., noise, increased human activity in area) of active nests of raptors and other special-status bird species (as listed in **Table 4.3-1**) within or in the vicinity of the proposed footprint of a future development project shall be avoided in accordance with the following procedures for Pre-Construction Special-Status Avian Surveys and Subsequent Actions. No more than two weeks in advance of any tree or shrub removal or demolition or construction activity involving particularly noisy or intrusive activities (such as concrete breaking) that will commence during the breeding season (February 1 through July 31), a qualified wildlife biologist shall conduct pre-construction surveys of all potential special-status bird nesting habitat in the vicinity of the planned activity and, depending on the survey findings, the following actions shall be taken to avoid potential adverse effects on special-status nesting birds:

1. Pre-construction surveys are not required for demolition or construction activities scheduled to occur during the non-breeding season (August 1 through January 31).

2. If pre-construction surveys indicate that no nests of special-status birds are present or that nests are inactive or potential habitat is unoccupied, no further mitigation is required.

3. If active nests of special-status birds are found during the surveys, a no-disturbance buffer zone will be created around active nests during the breeding season or until a qualified biologist determines that all young have fledged. The size of the buffer zones and types of construction activities restricted within them will be determined through consultation with the CDFG, taking into account factors such as the following:

    a. noise and human disturbance levels at the project site and the nesting site at the time of the survey and the noise and disturbance expected during the construction activity;

    b. distance and amount of vegetation or other screening between the project site and the nest; and

    c. sensitivity of individual nesting species and behaviors of the nesting birds.

4. Noisy demolition or construction activities as described above (or activities producing similar substantial increases in noise and activity levels in the vicinity) commencing during the non-breeding season and continuing into the breeding season do not require surveys (as it is assumed that any breeding birds taking up nests would be acclimated to project-related activities already under way). However, if trees and shrubs are to be removed during the breeding season, the trees and shrubs will be surveyed for nests prior to their removal, according to the survey and protective action guidelines 3a through 3c, above.

5. Nests initiated during demolition or construction activities would be presumed to be unaffected by the activity, and a buffer zone around such nests would not be necessary.

6. Destruction of active nests of special-status birds and overt interference with nesting activities of special-status birds shall be prohibited.

7. The noise control procedures for maximum noise, equipment, and operations identified in Section IV.I, Noise, of this EIR[1] shall be implemented.

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1 Refers to 2006 LRDP EIR.

SPF BIO-5a: With the approval of the USFWS on a case-by-case basis, relocate any snake encountered during construction that is at risk of harassment; cease construction activity until the snake is moved to suitable refugium. Alternatively, submit a general protocol for relocation to the USFWS for approval prior to project implementation.

SPF BIO-5b: Conduct focused pre-construction surveys for the Alameda whipsnake at all project sites within or directly adjacent to areas mapped as having high potential for whipsnake occurrence. Project sites within high potential areas shall be fenced to exclude snakes prior to project implementation. This would not include ongoing and non-site-specific activities such as fuel management.

Methods for pre-construction surveys burrow excavation, and site fencing shall be developed prior to implementation of any project located within or adjacent to areas mapped as having high potential for whipsnake occurrence. Such methods would be developed in consultation or with approval of USFWS for any development taking place in USFWS officially designated Alameda whipsnake critical habitat. Pre-construction surveys of such project sites shall be carried out by a permitted biologist familiar with whipsnake identification and ecology (Swaim 2002). These are not intended to be protocol-level surveys but designed to clear an area so that individual whipsnakes are not present within a given area prior to initiation of construction. At sites where the project footprint would not be contained entirely within an existing developed area footprint and natural vegetated areas would be disturbed, any existing animal burrows shall be carefully hand-excavated to ensure that there are no whipsnakes within the project footprint. Any whipsnakes found during these surveys shall be relocated according to the Alameda Whipsnake Relocation Plan. Snakes of any other species found during these surveys shall also be relocated out of the project area. Once the site is cleared, it shall then be fenced in such a way as to exclude snakes for the duration of the project. Fencing shall be maintained intact throughout the duration of the project.

SPF BIO-5c: (1) A full-time designated monitor shall be employed at project sites that are within or directly adjacent to areas designated as having high potential for whipsnake occurrence, or (2) Daily site surveys for Alameda whipsnake shall be carried out by a designated monitor at construction sites within or adjacent to areas designated as having moderate potential for whipsnake occurrence.

Each morning, prior to initiating excavation, construction, or vehicle operation at sites identified as having moderate or high potential for whipsnake occurrence, the project area of applicable construction sites shall be surveyed by a designated monitor trained in Alameda whipsnake identification to ensure that no Alameda whipsnakes are present. This survey is not intended to be a protocol-level survey. All laydown and deposition areas, as well as other areas that might conceal or shelter snakes or other animals, shall be inspected each morning by the designated monitor to ensure that Alameda whipsnakes are not present. All materials will be stored to avoid entrapment of wildlife. At sites in high potential areas, the monitor shall remain on site during construction hours. At sites in moderate potential areas, the monitor shall remain on-call during construction hours in the event that a snake is found on site. The designated monitor shall have the authority to halt construction activities in the event that a whipsnake is found within the construction footprint until such time as threatening activities can be eliminated in the vicinity of the snake and it can be removed from the site by a biologist permitted to handle Alameda whipsnakes or allowed to escape voluntarily without harassment. The USFWS shall be notified within 24 hours of any such event.

SPF BIO-5d: Alameda whipsnake awareness and relevant environmental sensitivity training for each worker shall be conducted by the designated monitor prior to commencement of on-site activities. All on-site workers at applicable construction sites shall attend an Alameda whipsnake information session conducted by the designated monitor prior to beginning work. This session shall cover identification of the species and procedures to be followed if an individual is found on site, as well as basic site rules meant to protect biological resources, such as speed limits and daily trash pickup.

SPF BIO-5e: Hours of operation and speed limits shall be instituted and posted. All construction activities that take place on the ground (as opposed to within buildings) at applicable construction sites shall be performed during daylight hours or with suitable lighting so that snakes can be seen. Vehicle speed on the construction site shall not exceed 5 miles per hour.

SPF BIO-5f: Site vegetation management shall take place prior to tree removal, grading, excavation, or other construction activities. Construction materials, soil, construction debris, or other material shall be deposited only on areas where vegetation has been mowed.

Areas where development is proposed under the 2006 LRDP are subject to annual vegetation management involving the close cropping of all grasses and ground covers; this management activity would be performed prior to initiating project-specific construction. Areas would be re-mowed if grass or other vegetation on the project site becomes high enough to conceal whipsnakes during the construction period. In areas not subject to annual vegetation management, dense vegetation would be removed prior to the onset of grading or the use of any heavy machinery, using goats, manual brush cutters, or a combination thereof.

SPF CUL-3: If an archaeological artifact is discovered on site during construction under the proposed LRDP, all activities within a 50-foot radius shall be halted and a qualified archaeologist shall be summoned within 24 hours to inspect the site. If the find is determined to be significant and to merit formal recording or data collection, adequate time and funding shall be devoted to salvage the material. Any archaeologically important data recovered during monitoring shall be cleaned, catalogued, and analyzed, with the results presented in a report of finding that meets professional standards.

SPF CUL-4: In the event that human skeletal remains are uncovered during construction or ground-breaking activities resulting from implementation of the 2006 LRDP at the LBNL site, *CEQA Guidelines* Section 15064.5(e)(1) shall be followed:

- In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:

(1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

(A) The coroner of the county in which the remains are discovered must be contacted to determine that no investigation of the cause of death is required, and

(B) If the coroner determines the remains to be Native American: (1) The coroner shall contact the Native American Heritage Commission within 24 hours; (2) The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American. (3) The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or

(2) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.

(A) The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission;

(B) The descendant identified fails to make a recommendation; or

(C) The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.

SPF VIS-4a: All new buildings on the LBNL hill site constructed pursuant to the 2006 LRDP shall incorporate design standards that ensure lighting would be designed to confine illumination to its specific site, in order to minimize light spillage to adjacent LBNL buildings and open space areas. Consistent with safety considerations, LBNL project buildings shall shield and orient light sources so that they are not directly visible from outside their immediate surroundings.

SPF VIS-4b: New exterior lighting fixtures shall be compatible with existing lighting fixtures and installations in the vicinity of the new building, and will have an individual photocell. In general, and consistent with safety considerations, exterior lighting at building entrances, along walkways and streets, and at parking lots shall maintain an illumination level of not more than 20 Lux (approximately 2 foot-candles).

SPF VIS-4c: All new buildings on the LBNL hill site constructed pursuant to the 2006 LRDP shall incorporate design standards that preclude or limit the use of reflective exterior wall materials or reflective glass, or the use of white surfaces for roofs, roads, and parking lots, except in specific instances when required for energy conservation.

SPF AQ-1a: During construction of the proposed LRDP buildings, the developer must implement all "basic" control measures to minimize the generation of fugitive dust. In addition, for construction sites greater than 4 acres or projects that would generate large amounts of fugitive dust, "enhanced" and "optional" control measures should be implemented. The recommended control measures are located in Table 2 of the *BAAQMD CEQA Guidelines*.

SPF AQ-1b: During construction of the proposed LRDP buildings, the developer must implement the following mitigation measures to minimize heavy-duty construction equipment exhaust.

- Construction equipment shall be properly tuned and maintained in accordance with manufacturer's specifications.
- Best management construction practices shall be used to avoid unnecessary emissions (e.g., truck and vehicles in loading and unloading queues would turn their engines off when not in use).

- Any stationary motor sources such as generators and compressors located within 100 feet of a sensitive receptor shall be equipped with a supplementary exhaust pollution control system as required by the BAAQMD and CARB.

- Incorporate use of low-NO_X-emitting, low-particulate-emitting, or alternatively fueled construction equipment into the construction equipment fleet where feasible, especially when operating near sensitive receptors.

- Reduce construction-worker trips with ride sharing or alternative modes of transportation.

SPF NOISE-1a: To reduce daytime noise impacts due to construction/ demolition, LBNL shall require construction/demolition to implement noise reduction measures appropriate for the project being undertaken. Measures that might be implemented could include, but not be limited to, the following:

- Construction/demolition activities would be limited to a schedule that minimizes disruption to uses surrounding the project site as much as possible. Such activities would be limited to the hours designated in the Berkeley and/or Oakland noise ordinance(s), as applicable to the location of the project. This would eliminate or substantially reduce noise impacts during the more noise-sensitive nighttime hours and on days when construction noise might be more disturbing.

- To the maximum extent feasible, equipment and trucks used for project construction shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible).

- Stationary noise sources shall be located as far from adjacent receptors as possible.

- At locations where noise may affect neighboring residential uses, LBNL will develop a comprehensive construction noise control specification to implement construction/demolition noise controls, such as noise attenuation barriers, siting of construction laydown and vehicle staging areas, and community outreach, as appropriate to specific projects. The specification will include such information as general provisions, definitions, submittal requirements, construction limitations, requirements for noise and vibration monitoring and control plans, noise control materials and methods. This document will be modified as appropriate for a particular construction project and included within the construction specification.

SPF NOISE-1b: For each subsequent project pursuant to the LRDP that would involve construction and/or demolition activities, LBNL shall engage a qualified noise consultant to determine whether, based on the location of the site and the activities proposed, construction/demolition noise levels could approach the property line receiving noise standards of the cities of Berkeley or Oakland (as applicable). If the consultant determines that the standards would not be exceeded, no further mitigation is required. If the standards would be reached or exceeded absent further mitigation, one or more of the following additional measures would be required, as determined necessary by the noise consultant.

- Stationary noise sources shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or other measures to the extent feasible.

- Impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dB(A). External jackets on the tools themselves shall be used where feasible, and this could achieve a reduction of 5 dB(A). Quieter procedures shall be used, such as drills rather than impact equipment, whenever feasible.

- Noise from idling trucks shall be kept to a minimum. No trucks shall be permitted to idle for more than 10 minutes if waiting within 100 feet of a residential area.

- If determined necessary by the noise consultant, a set of site-specific noise attenuation measures shall be developed before construction begins; possible measures might include erection of temporary noise barriers around the construction site, use of noise control blankets on structures being erected to reduce noise emission from the site, evaluation of the feasibility of noise control at the receivers by temporarily improving the noise reduction capability of adjacent buildings, and monitoring the effectiveness of noise attenuation measures by taking noise measurements.

- If determined necessary by the noise consultant, at least two weeks prior to the start of excavation, LBNL or its contractor shall provide written notification to all neighbors within 500 feet of the construction site. The notification shall indicate the estimated duration and completion date of the construction, construction hours, and necessary contact information for potential complaints about construction noise (i.e., name, telephone number, and address of party responsible for construction). The notice shall indicate that noise complaints resulting from construction can be directed to the contact person identified in the notice. The name and phone number of the contact person also shall be posted outside the LBNL boundaries.

SPF NOISE-4: Mechanical equipment shall be selected and building designs prepared for all future development projects pursuant to the 2006 LRDP so that noise levels from future building and other facility operations would not exceed the Noise Ordinance limits of the cities of Berkeley or Oakland for commercial areas or residential zones as measured on any commercial or residential property in the area surrounding the future LRDP project.

Controls that would typically be incorporated to attain adequate noise reduction would include selection of quiet equipment, sound attenuators on fans, sound attenuator packages for cooling towers and emergency generators, acoustical screen walls, and equipment enclosures.

SPF UTILS-4: LBNL shall develop a plan for maximizing diversion of construction and demolition materials associated with the construction of the proposed project from landfill disposal.

APPENDIX 2

Cultural Resources Consultation

APPENDIX 2

TABLE OF CONTENTS

Section 106 Consultation

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
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April 15, 2010

Sean Dexter
Condor Country
411 Perry St.
Martinez, CA 94553

Sent by Fax: 925-231-0571
Number of Pages: 2

Re: Proposed Project # 00104, Alameda County

Dear Mr. Dexter:

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4038.

Sincerely,

For

Debbie Pilas-Treadway
Environmental Specialist III

Native American Contacts
Alameda County
April 14, 2010

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831-637-4238
Ohlone/Costanoan

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed project # 00104, Alameda County

CONDOR COUNTRY
CONSULTING, INC.

March 31, 2010

Ms. Katherine Erolinda Perez
PO Box 717
Linden, CA 95236-0717

Subject: **Cultural Resources Consultation for the proposed Computational Research and Theory Facility (CRT), Lawrence Berkeley National Laboratory.**

Dear Ms. Perez,:

The US Department of Energy (DOE) and the University of California (UC) are in the process of planning a new research facility at the Lawrence Berkeley National Laboratory (LBNL), in Alameda County, California. As the federal lead agency, the DOE is analyzing the potential environmental effects of the proposed project in compliance with the National Environmental Policy Act. The DOE, through its subcontractors UC, Impact Sciences, Inc., and Condor Country Consulting, Inc., is offering you the opportunity to comment on this project.

The DOE proposes to relocate and consolidate all Advanced Scientific Computing Research-funded LBNL programs in one location on the LBNL hill site. UC proposes to construct a new building on the LBNL hill site where these programs could be relocated and consolidated. The new building and associated infrastructure would be constructed and owned by UC and would be called the Computational Research and Theory (CRT) facility. The facility would be operated and maintained by the University.

The approximately 2.25-acre CRT project site is located on the LBNL hill site. LBNL is located east of the main campus of UC Berkeley, within the cities of Berkeley and Oakland in Alameda County, and is located on land owned by the University of California. The project site is located near the western entrance to the LBNL hill site in the city of Berkeley and has frontage on Seaborg Road. The project site comprises steeply sloped terrain and is vegetated with non-native grasses and eucalyptus, immature redwood, bay, and oak trees; much of the area appears to have been previously disturbed. The CRT project site is flanked on three sides by LBNL Buildings 70 and 70A to the east, the Building 50 complex to the north, and Cyclotron Road and the LBNL's Blackberry Canyon entrance gate to the west. Maps showing the project area are enclosed for your reference (see enclosures).

The CRT facility includes an approximately 126,000-gross-square-foot building and associated infrastructure, including access driveways and pedestrian access, and a central plant. The approximately 126,000-gross-square-foot (gsf), three-story building would include a supercomputer equipment floor and two floors of offices, with space for computing, offices, and conference rooms. The proposed building abuts a steep hillside, and the upper floor of the building would be accessible from the existing parking lot that connects the Building 50 and 70 complexes.

The facility would accommodate (1) the National Energy Research Scientific Computing (NERSC) Center, including NERSC's high performance computing systems, (2) researchers from the LBNL's Computational Research Division, and (3) researchers and students from the joint UC/Berkeley Lab Computational Science and Engineering program. The new advanced computational equipment and office space would support UC Berkeley's academic programs in computational science and engineering and the needs of computer scientists, mathematicians, and theoreticians who are currently engaged in high performance computing and high performance production computing and computational research.

There are several known prehistoric and historic archaeological sites within ½-mile of the study area. However, no previous archaeological and/or historical resources have been identified within the study area. There are no current plans to evaluate and/or to impact known sites or potentially historic buildings. In March of 2010, archaeologists from Condor Country Consulting inspected and surveyed the study area to assess the potential for any intact archaeological sites to be present within the project area. No archaeological or historic resources were encountered other than one isolated fragment of obsidian found in a highly-disturbed context on the side of a steep slope.

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Thank you in advance for any assistance you can provide.

Sincerely,

Sean Dexter

Sean Dexter
Principal Archaeologist
Condor Country Consulting, Inc.

Enclosures: Project Area Maps (2)

cc: Ms. Shabnam Barati, Project Manager, Impact Sciences, Inc., 555 12th Street
Suite 1650, Oakland, CA 94607

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CONDOR COUNTRY

CONSULTING, INC.

March 31, 2010

Mr. Andrew Galvan
The Ohlone Indian Tribe
PO Box 3152
Fremont, CA 94539-0315

Subject: **Cultural Resources Consultation for the proposed Computational Research and Theory Facility (CRT), Lawrence Berkeley National Laboratory.**

Dear Mr. Galvan,:

The US Department of Energy (DOE) and the University of California (UC) are in the process of planning a new research facility at the Lawrence Berkeley National Laboratory (LBNL), in Alameda County, California. As the federal lead agency, the DOE is analyzing the potential environmental effects of the proposed project in compliance with the National Environmental Policy Act. The DOE, through its subcontractors UC, Impact Sciences, Inc., and Condor Country Consulting, Inc., is offering you the opportunity to comment on this project.

The DOE proposes to relocate and consolidate all Advanced Scientific Computing Research-funded LBNL programs in one location on the LBNL hill site. UC proposes to construct a new building on the LBNL hill site where these programs could be relocated and consolidated. The new building and associated infrastructure would be constructed and owned by UC and would be called the Computational Research and Theory (CRT) facility. The facility would be operated and maintained by the University.

The approximately 2.25-acre CRT project site is located on the LBNL hill site. LBNL is located east of the main campus of UC Berkeley, within the cities of Berkeley and Oakland in Alameda County, and is located on land owned by the University of California. The project site is located near the western entrance to the LBNL hill site in the city of Berkeley and has frontage on Seaborg Road. The project site comprises steeply sloped terrain and is vegetated with non-native grasses and eucalyptus, immature redwood, bay, and oak trees; much of the area appears to have been previously disturbed. The CRT project site is flanked on three sides by LBNL Buildings 70 and 70A to the east, the Building 50 complex to the north, and Cyclotron Road and the LBNL's Blackberry Canyon entrance gate to the west. Maps showing the project area are enclosed for your reference (see enclosures).

The CRT facility includes an approximately 126,000-gross-square-foot building and associated infrastructure, including access driveways and pedestrian access, and a central plant. The approximately 126,000-gross-square-foot (gsf), three-story building would include a supercomputer equipment floor and two floors of offices, with space for computing, offices, and conference rooms. The proposed building abuts a steep hillside, and the upper floor of the building would be accessible from the existing parking lot that connects the Building 50 and 70 complexes.

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CONDOR COUNTRY
CONSULTING, INC.

March 31, 2010

Representative Ramona Garibay
Trina Marine Ruano Family
16010 Halmar Lane
Lathrop, CA 95330-9757

Subject: **Cultural Resources Consultation for the proposed Computational Research and Theory Facility (CRT), Lawrence Berkeley National Laboratory.**

Dear Representative Garibay,:

The US Department of Energy (DOE) and the University of California (UC) are in the process of planning a new research facility at the Lawrence Berkeley National Laboratory (LBNL), in Alameda County, California. As the federal lead agency, the DOE is analyzing the potential environmental effects of the proposed project in compliance with the National Environmental Policy Act. The DOE, through its subcontractors UC, Impact Sciences, Inc., and Condor Country Consulting, Inc., is offering you the opportunity to comment on this project.

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CONDOR COUNTRY
CONSULTING, INC.

March 31, 2010

Ms. Jakki Kehl
720 N 2ND ST
Patterson, CA 95363-2154

Subject: **Cultural Resources Consultation for the proposed Computational Research and Theory Facility (CRT), Lawrence Berkeley National Laboratory.**

Dear Ms. Kehl,:

The US Department of Energy (DOE) and the University of California (UC) are in the process of planning a new research facility at the Lawrence Berkeley National Laboratory (LBNL), in Alameda County, California. As the federal lead agency, the DOE is analyzing the potential environmental effects of the proposed project in compliance with the National Environmental Policy Act. The DOE, through its subcontractors UC, Impact Sciences, Inc., and Condor Country Consulting, Inc., is offering you the opportunity to comment on this project.

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Enclosures: Project Area Maps (2)

cc: Ms. Shabnam Barati, Project Manager, Impact Sciences, Inc., 555 12th Street
Suite 1650, Oakland, CA 94607

CONDOR COUNTRY
CONSULTING, INC.

March 31, 2010

Ms. Ramona Garabay
Muwekma Ohlone Indian Tribe of the SF Bay Area
PO Box 360791
Milpitas, CA 95036

Subject: **Cultural Resources Consultation for the proposed Computational Research and Theory Facility (CRT), Lawrence Berkeley National Laboratory.**

Dear Ms. Garabay,:

The US Department of Energy (DOE) and the University of California (UC) are in the process of planning a new research facility at the Lawrence Berkeley National Laboratory (LBNL), in Alameda County, California. As the federal lead agency, the DOE is analyzing the potential environmental effects of the proposed project in compliance with the National Environmental Policy Act. The DOE, through its subcontractors UC, Impact Sciences, Inc., and Condor Country Consulting, Inc., is offering you the opportunity to comment on this project.

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Enclosures: Project Area Maps (2)

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Suite 1650, Oakland, CA 94607

CONDOR COUNTRY
CONSULTING, INC.

March 31, 2010

Chairperson Irene Zwierlein
Amah/Mutsun Tribal Band
789 Canada Rd
Woodside, CA 94062

Subject: **Cultural Resources Consultation for the proposed Computational Research and Theory Facility (CRT), Lawrence Berkeley National Laboratory.**

Dear Chairperson Zwierlein,:

The US Department of Energy (DOE) and the University of California (UC) are in the process of planning a new research facility at the Lawrence Berkeley National Laboratory (LBNL), in Alameda County, California. As the federal lead agency, the DOE is analyzing the potential environmental effects of the proposed project in compliance with the National Environmental Policy Act. The DOE, through its subcontractors UC, Impact Sciences, Inc., and Condor Country Consulting, Inc., is offering you the opportunity to comment on this project.

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CONDOR COUNTRY
CONSULTING, INC.

March 31, 2010

Chairperson Ann Marie Sayers
Indian Canyon Mutsun Band of Ohlone
PO Box 28
Hollister, CA 95024

Subject: **Cultural Resources Consultation for the proposed Computational Research and Theory Facility (CRT), Lawrence Berkeley National Laboratory.**

Dear Chairperson Sayers,:

The US Department of Energy (DOE) and the University of California (UC) are in the process of planning a new research facility at the Lawrence Berkeley National Laboratory (LBNL), in Alameda County, California. As the federal lead agency, the DOE is analyzing the potential environmental effects of the proposed project in compliance with the National Environmental Policy Act. The DOE, through its subcontractors UC, Impact Sciences, Inc., and Condor Country Consulting, Inc., is offering you the opportunity to comment on this project.

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Suite 1650, Oakland, CA 94607

CONDOR COUNTRY
CONSULTING, INC.

March 31, 2010

Ms. Jean Marie Feyling
AMAH/MUTSUN TRIBAL BAND
19350 Hunter Ct.
Redding, CA 96003-8638

Subject: **Cultural Resources Consultation for the proposed Computational Research and Theory Facility (CRT), Lawrence Berkeley National Laboratory.**

Dear Ms. Feyling,:

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The facility would accommodate (1) the National Energy Research Scientific Computing (NERSC) Center, including NERSC's high performance computing systems, (2) researchers from the LBNL's Computational Research Division, and (3) researchers and students from the joint UC/Berkeley Lab Computational Science and Engineering program. The new advanced computational equipment and office space would support UC Berkeley's academic programs in computational science and engineering and the needs of computer scientists, mathematicians, and theoreticians who are currently engaged in high performance computing and high performance production computing and computational research.

There are several known prehistoric and historic archaeological sites within ½-mile of the study area. However, <u>no previous archaeological and/or historical resources have been identified within the study area</u>. There are no current plans to evaluate and/or to impact known sites or potentially historic buildings. In March of 2010, archaeologists from Condor Country Consulting inspected and surveyed the study area to assess the potential for any intact archaeological sites to be present within the project area. No archaeological or historic resources were encountered other than one isolated fragment of obsidian found in a highly-disturbed context on the side of a steep slope.

At this time we would like to know whether you are aware of any traditional cultural places, traditional plant gathering areas, or sites of historic interest in or immediately adjacent to the project area. We understand that such information is sensitive and confidential and we will not release this information to unauthorized persons. Your involvement is valuable to us and we will do our best to ensure that any concerns you may have about the project are addressed.

A primary contact for information you may have related to Traditional Cultural Properties, traditional plant gathering areas, and/or sites of historic interest, is the LBNL's consultant, Mr. Sean Dexter, at Condor Country Consulting, 411 Ferry Street, Suite 6, Martinez, CA 94553-1145; tel. (925) 335-9308; fax (925) 231-0571.

Thank you in advance for any assistance you can provide.

Sincerely,

Sean Dexter

Sean Dexter
Principal Archaeologist
Condor Country Consulting, Inc.

Enclosures: Project Area Maps (2)

cc: Ms. Shabnam Barati, Project Manager, Impact Sciences, Inc., 555 12th Street
Suite 1650, Oakland, CA 94607

CONDOR COUNTRY
CONSULTING, INC.

March 31, 2010

Ms. Judy Kennedy, Secretary
Berkeley Historical Society
PO Box 1190
Berkeley, CA 94701

Subject: **Cultural Resources Consultation for the proposed Computational Research and Theory Facility (CRT), Lawrence Berkeley National Laboratory.**

Dear Ms. Kennedy,:

The US Department of Energy (DOE) and the University of California (UC) are in the process of planning a new research facility at the Lawrence Berkeley National Laboratory (LBNL), in Alameda County, California. As the federal lead agency, the DOE is analyzing the potential environmental effects of the proposed project in compliance with the National Environmental Policy Act. The DOE, through its subcontractors UC, Impact Sciences, Inc., and Condor Country Consulting, Inc., is offering you the opportunity to comment on this project.

The DOE proposes to relocate and consolidate all Advanced Scientific Computing Research-funded LBNL programs in one location on the LBNL hill site. UC proposes to construct a new building on the LBNL hill site where these programs could be relocated and consolidated. The new building and associated infrastructure would be constructed and owned by UC and would be called the Computational Research and Theory (CRT) facility. The facility would be operated and maintained by the University.

The approximately 2.25-acre CRT project site is located on the LBNL hill site. LBNL is located east of the main campus of UC Berkeley, within the cities of Berkeley and Oakland in Alameda County, and is located on land owned by the University of California. The project site is located near the western entrance to the LBNL hill site in the city of Berkeley and has frontage on Seaborg Road. The project site comprises steeply sloped terrain and is vegetated with non-native grasses and eucalyptus, immature redwood, bay, and oak trees; much of the area appears to have been previously disturbed. The CRT project site is flanked on three sides by LBNL Buildings 70 and 70A to the east, the Building 50 complex to the north, and Cyclotron Road and the LBNL's Blackberry Canyon entrance gate to the west. Maps showing the project area are enclosed for your reference (see enclosures).

The CRT facility includes an approximately 126,000-gross-square-foot building and associated infrastructure, including access driveways and pedestrian access, and a central plant. The approximately 126,000-gross-square-foot (gsf), three-story building would include a supercomputer equipment floor and two floors of offices, with space for computing, offices, and conference rooms. The proposed building abuts a steep hillside, and the upper floor of the building would be accessible from the existing parking lot that connects the Building 50 and 70 complexes.

The facility would accommodate (1) the National Energy Research Scientific Computing (NERSC) Center, including NERSC's high performance computing systems, (2) researchers from the LBNL's Computational Research Division, and (3) researchers and students from the joint UC/Berkeley Lab Computational Science and Engineering program. The new advanced computational equipment and office space would support UC Berkeley's academic programs in computational science and engineering and the needs of computer scientists, mathematicians, and theoreticians who are currently engaged in high performance computing and high performance production computing and computational research.

There are several known prehistoric and historic archaeological sites within ½-mile of the study area. However, <u>no previous archaeological and/or historical resources have been identified within the study area</u>. There are no current plans to evaluate and/or to impact known sites or potentially historic buildings. In March of 2010, archaeologists from Condor Country Consulting inspected and surveyed the study area to assess the potential for any intact archaeological sites to be present within the project area. No archaeological or historic resources were encountered other than one isolated fragment of obsidian found in a highly-disturbed context on the side of a steep slope.

At this time we would like to know whether you are aware of any traditional cultural places, traditional plant gathering areas, or sites of historic interest in or immediately adjacent to the project area. We understand that such information is sensitive and confidential and we will not release this information to unauthorized persons. Your involvement is valuable to us and we will do our best to ensure that any concerns you may have about the project are addressed.

A primary contact for information you may have related to Traditional Cultural Properties, traditional plant gathering areas, and/or sites of historic interest, is the LBNL's consultant, Mr. Sean Dexter, at Condor Country Consulting, 411 Ferry Street, Suite 6, Martinez, CA 94553-1145; tel. (925) 335-9308; fax (925) 231-0571.

Thank you in advance for any assistance you can provide.

Sincerely,

Sean Dexter

Sean Dexter
Principal Archaeologist
Condor Country Consulting, Inc.

Enclosures: Project Area Maps (2)

cc: Ms. Shabnam Barati, Project Manager, Impact Sciences, Inc., 555 12th Street
Suite 1650, Oakland, CA 94607

CONDOR COUNTRY
CONSULTING, INC.

March 31, 2010

Ms. Analee Allen
Alameda County Historical Society
PMB 307
484 Lake Park Ave.
Oakland, CA 94610-2730

Subject: **Cultural Resources Consultation for the proposed Computational Research and Theory Facility (CRT), Lawrence Berkeley National Laboratory.**

Dear Ms. Allen,:

The US Department of Energy (DOE) and the University of California (UC) are in the process of planning a new research facility at the Lawrence Berkeley National Laboratory (LBNL), in Alameda County, California. As the federal lead agency, the DOE is analyzing the potential environmental effects of the proposed project in compliance with the National Environmental Policy Act. The DOE, through its subcontractors UC, Impact Sciences, Inc., and Condor Country Consulting, Inc., is offering you the opportunity to comment on this project.

The DOE proposes to relocate and consolidate all Advanced Scientific Computing Research-funded LBNL programs in one location on the LBNL hill site. UC proposes to construct a new building on the LBNL hill site where these programs could be relocated and consolidated. The new building and associated infrastructure would be constructed and owned by UC and would be called the Computational Research and Theory (CRT) facility. The facility would be operated and maintained by the University.

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The CRT facility includes an approximately 126,000-gross-square-foot building and associated infrastructure, including access driveways and pedestrian access, and a central plant. The approximately 126,000-gross-square-foot (gsf), three-story building would include a supercomputer equipment floor and two floors of offices, with space for computing, offices, and conference rooms. The proposed building abuts a steep hillside, and the upper floor of the building would be accessible from the existing parking lot that connects the Building 50 and 70 complexes.

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There are several known prehistoric and historic archaeological sites within ½-mile of the study area. However, no previous archaeological and/or historical resources have been identified within the study area. There are no current plans to evaluate and/or to impact known sites or potentially historic buildings. In March of 2010, archaeologists from Condor Country Consulting inspected and surveyed the study area to assess the potential for any intact archaeological sites to be present within the project area. No archaeological or historic resources were encountered other than one isolated fragment of obsidian found in a highly-disturbed context on the side of a steep slope.

At this time we would like to know whether you are aware of any traditional cultural places, traditional plant gathering areas, or sites of historic interest in or immediately adjacent to the project area. We understand that such information is sensitive and confidential and we will not release this information to unauthorized persons. Your involvement is valuable to us and we will do our best to ensure that any concerns you may have about the project are addressed.

A primary contact for information you may have related to Traditional Cultural Properties, traditional plant gathering areas, and/or sites of historic interest, is the LBNL's consultant, Mr. Sean Dexter, at Condor Country Consulting, 411 Ferry Street, Suite 6, Martinez, CA 94553-1145; tel. (925) 335-9308; fax (925) 231-0571.

Thank you in advance for any assistance you can provide.

Sincerely,

Sean Dexter

Sean Dexter
Principal Archaeologist
Condor Country Consulting, Inc.

Enclosures: Project Area Maps (2)

cc: Ms. Shabnam Barati, Project Manager, Impact Sciences, Inc., 555 12th Street
Suite 1650, Oakland, CA 94607

Northwest Information Center Results for Proposed Action Site

CALIFORNIA
HISTORICAL
RESOURCES
INFORMATION
SYSTEM

ALAMEDA
COLUSA
CONTRA COSTA
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO
SAN MATEO
SANTA CLARA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
1303 Maurice Avenue
Rohnert Park, California 94928-3609
Tel: 707.664.0880 • Fax: 707.664.0890
Email: leigh.jordan@sonoma.edu
http://www.sonoma.edu/nwic

Date: 23 March 2010 NWIC File No: 09-0934

To: Sean Dexter, Condor Country Consulting, Inc., 411 Ferry Street, Suite 6, Martinez, CA 94553-1145

From: Lisa Hagel

re: Berkeley National Lab Computational Research & Theory (CRT) Facility

Oakland West, Oakland East, Richmond, & Briones Valley 7.5'

Sites in or within 1/2 mile radius of the project area: There were no recorded sites within the project area. P-01-10685, 43, 10669, 230, 85, 10578, & 10663 are within ½ mile. A database printout for the resources, a copy of P-01-10685, and the mapped locations of the resources are in pdf format on the enclosed cd.

Studies in or within 1/2 mile radius of the project area: S-848, 7903, 9583, 9795, 2458, 9462, 17698, 16660, 20395, 33239, 33600, & 1784 (all overview reports); S-28039 & 8719 included the project location. S-33545, 29012, 30997, 445, 9452, 17501, 20513, 21110, 28828, 28829, 28830, 29668, 31361, & 35041 are within ½ mile. Bibliographic references for the reports and the mapped locations of the studies are in pdf format on the enclosed cd.

OHP Historic Properties Directory: Copied the indices for Berkeley. None of the above referenced sites have been evaluated for National Register eligibility.

California Inventory of Historic Resources: Copied the index pages with properties in Berkeley.

Historic Maps (copied the pertinent sections of the maps):
(Nothing was shown in the vicinity of the project on the 1859 Rancho San Antonio (V and D Peralta) Plat Map)
1878 Thompson & West, Historical Atlas Map of Alameda County, California
1895 & 1815 USGS San Francisco Quadrangles
1942 US Army Corps of Engineers, San Francisco Quadrangle, Grid Zone "G"

Northwest Information Center Results for Richmond Field Station Alternative Site

CALIFORNIA
HISTORICAL
RESOURCES
INFORMATION
SYSTEM

ALAMEDA COLUSA CONTRA COSTA LAKE MARIN MENDOCINO MONTEREY NAPA SAN BENITO SAN FRANCISCO SAN MATEO SANTA CLARA SANTA CRUZ SOLANO SONOMA YOLO

Northwest Information Center
Sonoma State University
150 Professional Center Drive, Suite E
Rohnert Park, California 94928-3609
Tel: 707.566.6455
Email: leigh.jordan@sonoma.edu
http://www.sonoma.edu/nwic

August 5, 2010 NWIC File No.: 10-0123

Sara Morton
Impact Sciences
555 12th Street, Suite 1650
Oakland, CA 94607

Re: Rapid response record search results for the proposed Alternative Site at the Richmond Field Station for the Computational Research and Theory Facility Project.

Dear Ms. Morton:

Per your request received by our office on August 3, 2010, a rapid response records search was conducted for the above referenced project by reviewing pertinent Northwest Information Center (NWIC) base maps that reference cultural resources records and reports, historic-period maps, and literature for Contra Costa County. Please note that use of the term cultural resources includes both archaeological resources and historical buildings and/or structures.

Review of this information indicates that there have been two cultural resource studies that include 100% of the Computational Research and Theory Facility project area; Holman 1989: S-11762, an archaeological field survey; and Holman 1989: S-11763, a building evaluation. This project area contains no recorded cultural resources. Local, state and federal inventories include no recorded buildings or structures within the proposed project area. In addition to these inventories, the NWIC base maps show no recorded buildings or structures.

At the time of Euroamerican contact the Native Americans that lived in the area were speakers of the Chochenyo language, part of the Costanoan language family (Levy 1978:485). There are several Native American resources in or adjacent to the proposed project area referenced in the ethnographic literature [the tribal territory of the Huchiun [also spelled Xuycun] (Levy 1978: 485, Milliken 1995: 243), as well as several Shellmound Sites (Nelson 1909)].

Based on an evaluation of the environmental setting and features associated with known sites, Native American resources in this part of Contra Costa County have been found in areas marginal to the bayshore, and inland near intermittent and perennial watercourses. The Computational Research and Theory Facility project area contains alluvial terraces approximately 450 yards from the former bayshore (Nichols and Wright 1971). Given the similarity of one or more of these environmental factors and the ethnographic sensitivity of the area, there is a moderate to high potential of identifying unrecorded Native American resources in the proposed Computational Research and Theory Facility project area.

Review of historical literature and maps indicated the possibility of historic-period archaeological resources within the Computational Research and Theory Facility project area. The 1915 USGS San Francisco 15-minute topographic quadrangle depicts two to three buildings within the project area. With this in mind, there is a moderate potential of identifying unrecorded historic-period archaeological resources in the proposed Computational Research and Theory Facility project area.

The 1959 USGS Richmond 7.5-minute topographic quadrangle fails to depict any buildings or structures within the Computational Research and Theory Facility project area; therefore, there is a low possibility of identifying any buildings or structures 45 years or older within the project area.

RECOMMENDATIONS:

1) There is a moderate to high possibility of identifying Native American archaeological resources and a moderate possibility of identifying historic-period archaeological resources in the project area. Holman's previous studies from 1989 included 100% of the project area. However, due to the passage of time since the previous surveys and the changes in archaeological theory and method since that time, we recommend a qualified archaeologist conduct further examination of the project area to identify cultural resources. Our usual recommendation would include archival research and a field examination. The proposed project area, however, has been highly developed and is presently covered with asphalt, buildings, or fill that obscures the visibility of original surface soils, which negates the feasibility of an adequate surface inspection. It is recommended that prior to ground disturbance, archival research be conducted to determine the appropriate locations for archaeological monitoring during removal of asphalt or concrete, fill, vegetation, or structures. Following the exposure of the original soils, it is recommended that a field inspection be conducted and a report containing "next-step" recommendations be provided. Please refer to the list of consultants who meet the Secretary of Interior's Standards at http://www.chrisinfo.org.

2) If the area of potential effect contains buildings or structures that meet the minimum age requirement, we recommend that the agency responsible for Section 106 compliance consult with the Office of Historic Preservation regarding potential impacts to these buildings or structures.

Project Review and Compliance Unit
Office of Historic Preservation
P.O. Box 942896
Sacramento, CA 94296-0001
(916) 653-6624

3) Review for possible historic-period buildings or structures has included only those sources listed in the attached bibliography and should not be considered comprehensive.

4) If archaeological resources are encountered **during construction,** work should be temporarily halted in the vicinity of the discovered materials and workers should avoid altering the materials and their context until a qualified professional archaeologist has evaluated the situation and provided appropriate recommendations. Project personnel should not collect cultural resources. Native American resources include chert or obsidian flakes, projectile points, mortars, and pestles; and dark friable soil containing shell and bone dietary debris, heat-affected rock, or human burials. Historic-period resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits or bottle dumps, often located in old wells or privies.

5) It is recommended that any identified cultural resources be recorded on DPR 523 historic resource recordation forms, available online from the Office of Historic Preservation's website: http://ohp.parks.ca.gov/default.asp?page_id=1069

Thank you for using our services. Please contact this office if you have any questions, (707) 664-0880.

Sincerely,

Jillian E. Guldenbrein

Jillian Guldenbrein
Researcher

LITERATURE REVIEWED

In addition to archaeological maps and site records on file at the Northwest Information Center of the Historical Resources Information System, the following literature was reviewed:

Bowman, J.N.
1951 *Adobe Houses in the San Francisco Bay Region.* Geologic Guidebook of the San Francisco Bay Counties, Bulletin 154. California Division of Mines, Ferry Building, San Francisco, CA.

Contra Costa County Planning Department
1976 Preliminary Historic Resources Inventory, Contra Costa County, California. Prepared by Contra Costa County Planning Department, n.p.

General Land Office
1858 Survey Plat for Rancho San Pablo.

Helley, E.J., K.R. Lajoie, W.E. Spangle, and M.L. Blair
1979 *Flatland Deposits of the San Francisco Bay Region - Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning.* Geological Survey Professional Paper 943. United States Geological Survey and Department of Housing and Urban Development.

Holman, Miley Paul (Holman & Associates)
1989 Additional Research into Historic Structures on the Richmond Field Station Property, Richmond, Contra Costa County, California. NWIC Report S-011763

1989 Archaeological Field Inspection of the Richmond Field Station, Richmond, Contra Costa County, California. NWIC Report S-011762

Hoover, Mildred Brooke, Hero Eugene Rensch, and Ethel Rensch, revised by William N. Abeloe
1966 *Historic Spots in California.* Third Edition. Stanford University Press, Stanford, CA.

Hoover, Mildred Brooke, Hero Eugene Rensch, and Ethel Rensch, William N. Abeloe, revised by Douglas E. Kyle
1990 *Historic Spots in California.* Fourth Edition. Stanford University Press, Stanford, CA.

Kroeber, A.L.
1925 *Handbook of the Indians of California.* Bureau of American Ethnology, Bulletin 78, Smithsonian Institution, Washington, D.C. (Reprint by Dover Publications, Inc., New York, 1976)

Levy, Richard
1978 Costanoan. In *California*, edited by Robert F. Heizer, pp. 485-495. Handbook of North American Indians, vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Milliken, Randall
1995 *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area 1769-1810.* Ballena Press Anthropological Papers No. 43, Menlo Park, CA.

Myers, William A. (editor)
1977 *Historic Civil Engineering Landmarks of San Francisco and Northern California.* Prepared by The History and Heritage Committee, San Francisco Section, American Society of Civil Engineers. Pacific Gas and Electric Company, San Francisco, CA.

Nelson, N.C.
1909 *Shellmounds of the San Francisco Bay Region.* University of California Publications in American Archaeology and Ethnology 7(4):309-356. Berkeley. (Reprint by Kraus Reprint Corporation, New York, 1964)

Nichols, Donald R., and Nancy A. Wright
1971 Preliminary Map of Historic Margins of Marshland, San Francisco Bay, California. U.S. Geological Survey Open File Map. U.S. Department of the Interior, Geological Survey in cooperation with the U.S. Department of Housing and Urban Development, Washington, D.C.

State of California Department of Parks and Recreation
1976 *California Inventory of Historic Resources.* State of California Department of Parks and Recreation, Sacramento.

State of California Office of Historic Preservation **
2010 *Historic Properties Directory.* Listing by City (through May 2010). State of California Office of Historic Preservation, Sacramento.

Welch, Lawrence E.
1977 *Soils Survey of Contra Costa County, California.* United States Department of Agriculture, Soil Conservation Service, in cooperation with the University of California Agricultural Experiment Station. n.p.

Williams, James C.
1997 *Energy and the Making of Modern California.* The University of Akron Press, Akron, OH.

Woodbridge, Sally B.
1988 *California Architecture: Historic American Buildings Survey.* Chronicle Books, San Francisco.

Works Progress Administration
1984 *The WPA Guide to California.* Reprint by Pantheon Books, New York. (Originally published as California: A Guide to the Golden State in 1939 by Books, Inc., distributed by Hastings House Publishers, New York.)

**Note that the Office of Historic Preservation's *Historic Properties Directory* includes National Register, State Registered Landmarks, California Points of Historical Interest, and the California Register of Historical Resources as well as Certified Local Government surveys that have undergone Section 106 review.

Northwest Information Center Results for 6701 San Pablo Avenue Alternative Site

CALIFORNIA
HISTORICAL
RESOURCES
INFORMATION
SYSTEM

ALAMEDA
COLUSA
CONTRA COSTA
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO
SAN MATEO
SANTA CLARA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
150 Professional Center Drive, Suite E
Rohnert Park, California 94928-3609
Tel: 707.588.8455
Email: leigh.jordan@sonoma.edu
http://www.sonoma.edu/nwic

August 9, 2010

NWIC File No.: 10-0135

Sara Morton
Impact Sciences
555 12th Street, Suite 1650
Oakland, CA 94607

Re: Rapid response record search results for the proposed Alternative Site for the Computational Research and Theory Facility Project at 6701 San Pablo Avenue, located on the boundary line of the Cities of Berkeley and Oakland, Alameda County, CA.

Dear Ms. Morton:

Per your request received by our office on August 6, 2010, a rapid response records search was conducted for the above referenced project by reviewing pertinent Northwest Information Center (NWIC) base maps that reference cultural resources records and reports, historic-period maps, and literature for Alameda County. Please note that use of the term cultural resources includes both archaeological resources and historical buildings and/or structures.

Review of this information indicates that there has been one cultural resource study that covers 100% of the Computational Research and Theory Facility Project area (Supernowicz 2006: S-32617), please note that this study only included an architectural evaluation. This project area contains no recorded archaeological resources; however, there is one recorded historic-period building, P-01-010862, the Marchant Building within the project area. The State Office of Historic Preservation's Historic Properties Directory (HPD) indicated three recorded buildings within or adjacent to the proposed project area; 1125, 1165, & 1249 67th Street. These buildings have three different status codes; 5S2, meaning this individual property is eligible for Local Listing or designation; 6Z, meaning this building was found ineligible for the National Register (NR), California Register (CR), or Local Designation through survey evaluation; and 7R, meaning this building was identified in a reconnaissance level survey, but not evaluted. See enclosed HPD page.

At the time of Euroamerican contact the Native Americans that lived in the area were speakers of the Chochenyo language, part of the Costanoan language family (Levy 1978:485). There is one Native American resource in or adjacent to the proposed project area referenced in the ethnographic literature [the tribal territory of the Huchiun-Aguasto (Milliken 1995:243)].

Based on an evaluation of the environmental setting and features associated with known sites, Native American resources in this part of Alameda County have been found in areas marginal to the bayshore, and inland near intermittent and perennial watercourses. The Computational Research and Theory Facility Project area contains an alluvial plain less than ½ mile from the former bayshore boundary, and was formerly bisected by a creek (Nichols and Wright 1971, 1899 USGS San Francisco 15-minute topographic quadrangle map). Given the similarity of one or more of these environmental factors, there is a moderate potential of identifying unrecorded Native American resources in the proposed Computational Research and Theory Facility Project area.

Review of historical literature and maps indicated the possibility of historic-period archaeological resources within the Computational Research and Theory Facility Project area. The 1899 and 1915 USGS San Francisco 15-minute topographic quadrangle maps indicate two to three buildings within the project area, as well, as an adjacent portion of railroad. With this in mind, there is a moderate potential of identifying unrecorded historic-period archaeological resources in the proposed Computational Research and Theory Facility Project area.

The 1959 USGS Oakland West 7.5-minute topographic quadrangle depicts one building or structure within the Computational Research and Theory Facility Project area. This building/structure meets the Office of Historic Preservation's minimum age standard that buildings, structures, and objects 45 years or older may be of historical value.

RECOMMENDATIONS:

1) There is a moderate possibility of identifying Native American archaeological resources and a moderate possibility of identifying historic-period archaeological resources in the project area. We recommend a qualified archaeologist conduct further archival and field study to identify cultural resources. Field study may include, but is not limited to, pedestrian survey, hand auger sampling, shovel test units, or geoarchaeological analyses as well as other common methods used to identify the presence of archaeological resources. Please refer to the list of consultants who meet the Secretary of Interior's Standards at http://www.chrisinfo.org.

2) In addition to the recorded building was identified in the project area, P-01-010862, the Marchant Building, the area of potential effect contains three recorded buildings or structures and possible other unrecorded buildings/structures; therefore, it is recommended that the agency responsible for Section 106 compliance consult with the Office of Historic Preservation regarding potential impacts to these buildings/structures.

Project Review and Compliance Unit
Office of Historic Preservation
P.O. Box 942896
Sacramento, CA 94296-0001
(916) 653-6624

3) Review for possible historic-period buildings or structures has included only those sources listed in the attached bibliography and should not be considered comprehensive.

4) If archaeological resources are encountered **during construction,** work should be temporarily halted in the vicinity of the discovered materials and workers should avoid altering the materials and their context until a qualified professional archaeologist has evaluated the situation and provided appropriate recommendations. Project personnel should not collect cultural resources. Native American resources include chert or obsidian flakes, projectile points, mortars, and pestles; and dark friable soil containing shell and bone dietary debris, heat-affected rock, or human burials. Historic-period resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits or bottle dumps, often located in old wells or privies.

5) It is recommended that any identified cultural resources be recorded on DPR 523 historic resource recordation forms, available online from the Office of Historic Preservation's website: http://ohp.parks.ca.gov/default.asp?page_id=1069

Thank you for using our services. Please contact this office if you have any questions, (707) 664-0880.

Sincerely,

Jillian E. Guldenbrein

Jillian E. Guldenbrein
Researcher

LITERATURE REVIEWED

In addition to archaeological maps and site records on file at the Historical Resources Information System, Northwest Information Center, the following literature was reviewed:

Bowman, J.N.

1951 *Adobe Houses in the San Francisco Bay Region.* In Geologic Guidebook of the San Francisco Bay Counties, Bulletin 154. California Division of Mines, Ferry Building, San Francisco, CA.

Cook, S.F.

1957 *The Aboriginal Population of Alameda and Contra Costa Counties.* University of California Anthropological Records 16(4):131-156. Berkeley and Los Angeles.

General Land Office

1859 Survey Plat for Rancho San Antonio (V&D Peralta).

Helley, E.J., K.R. Lajoie, W.E. Spangle, and M.L. Blair

1979 *Flatland Deposits of the San Francisco Bay Region - Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning.* Geological Survey Professional Paper 943. United States Geological Survey and Department of Housing and Urban Development.

Hoover, Mildred Brooke, Hero Eugene Rensch, and Ethel Rensch, revised by William N. Abeloe

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Hoover, Mildred Brooke, Hero Eugene Rensch, and Ethel Rensch, William N. Abeloe, revised by Douglas E. Kyle

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Kroeber, A.L.

1925 *Handbook of the Indians of California.* Bureau of American Ethnology, Bulletin 78, Smithsonian Institution, Washington, D.C. (Reprint by Dover Publications, Inc., New York, 1976).

Levy, Richard

1978 Costanoan. In *California,* edited by Robert F. Heizer, pp. 485-495. Handbook of North American Indians, vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Milliken, Randall

1995 *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area 1769-1810.* Ballena Press Anthropological Papers No. 43, Menlo Park, CA.

Myers, William A. (editor)

1977 *Historic Civil Engineering Landmarks of San Francisco and Northern California.* Prepared by The History and Heritage Committee, San Francisco Section, American Society of Civil Engineers. Pacific Gas and Electric Company, San Francisco, CA.

Nelson, N.C.
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**Note that the Office of Historic Preservation's *Historic Properties Directory* includes National Register, State Registered Landmarks, California Points of Historical Interest, and the California Register of Historical Resources as well as Certified Local Government surveys that have undergone Section 106 review.

NWIC File #10-0135 Historic Properties within the block of 6701 San Pablo Avenue p. 1 of 1

OFFICE OF HISTORIC PRESERVATION * * * Directory of Properties in the Historic Property Data File for ALAMEDA County. 05-18-10

PROPERTY-NUMBER	PRIMARY-#	STREET.ADDRESS............	NAMES............................	CITY.NAME........	OWN	YR-C	OHP-PROG..	PRG-REFERENCE-NUMBER	STAT-DAT	NRS	CRIT
							PROJ.REVW.	HUD980209D	04/10/98	6Y	
106522	01-009715	1122 65TH ST		OAKLAND	P	1860	HIST.SURV.	4623-3399-0000	01/27/97	7R	
093586	01-001324	1189 65TH ST	BETMON-CITY OF PARIS FRENCH LAUNDR	OAKLAND	P	1924	HIST.SURV.	4623-4755-0000	09/30/95	5S2	
							HIST.SURV.	4623-1679-0000	09/30/94	7R	
093587	01-001325	796 66TH AVE	McGUIRE & HESTER OFFICE BUILDING	OAKLAND	P	1958	HIST.SURV.	4623-4756-0000	09/30/95	6Z	
							HIST.SURV.	4623-1680-0000	09/30/94	7R	
093588	01-001326	915 66TH AVE	BODY COMPANY CANNERY WAREHOUSE	OAKLAND	P	1929	HIST.SURV.	4623-1681-0000	09/30/94	7R	
142644		1202 66TH AVE		OAKLAND	P	1944	HIST.SURV.	4623-3701-0001		7R	
122197	01-010284	1452 66TH AVE		OAKLAND	P	1924	HIST.RES.	DOE-01-99-0043-0000	06/17/99	6Y	
							PROJ.REVW.	HUD990511C	06/17/99	6Y	
080492	01-006938	1847 66TH AVE		OAKLAND	U	1925	PROJ.REVW.	HUD930209C	02/19/93	6Y	
091711	01-008174	2119 66TH AVE		OAKLAND	P	1931	PROJ.REVW.	HUD940815D	10/04/94	6Y	
112539	01-009981	2133 66TH AVE		OAKLAND	P	1925	HIST.RES.	DOE-01-97-0034-0000	10/22/97	6Y	
							PROJ.REVW.	HUD970929D	10/22/97	6Y	
102330	01-008493	2423 66TH AVE		OAKLAND	P	1925	PROJ.REVW.	HUD960419F	05/15/96	6Y	
107121	01-009903	2463 66TH AVE		OAKLAND	P	1923	PROJ.REVW.	HUD970226B	03/20/97	6Y	
122157	01-010279	2601 66TH AVE		OAKLAND	P	1919	HIST.RES.	DOE-01-99-0038-0000	06/14/99	6Y	
							PROJ.REVW.	HUD990413C	06/14/99	6Y	
082328	01-007027	2680 66TH AVE		OAKLAND	P	1925	PROJ.REVW.	HUD930513B	06/24/93	6Y	
							PROJ.REVW.	HUD930603A	06/14/93	6Y	
085320	01-007687	3500 66TH AVE		OAKLAND	P	1924	PROJ.REVW.	HUD931201B	01/07/94	6Y	
114828	01-010102	3561 66TH AVE		OAKLAND	P	1940	HIST.RES.	DOE-01-98-0011-0000	03/17/98	6Y	
							PROJ.REVW.	HUD980112M	03/17/98	6Y	
104354	01-008632	438 66TH ST		OAKLAND	P	1922	PROJ.REVW.	HUD961001A	10/22/96	6Y	
106523	01-009716	568 66TH ST		OAKLAND	P	1860	HIST.SURV.	4623-3400-0000	01/27/97	7R	
074231	01-006777	635 66TH ST		OAKLAND	U	1900	PROJ.REVW.	HUD911211E	01/07/92	6Y	
086628	01-007994	1085 66TH ST		OAKLAND	P	1908	PROJ.REVW.	HUD931220A	01/20/94	6Y	
123722	01-010336	1616 67TH AVE		OAKLAND	P	1924	HIST.RES.	DOE-01-99-0078-0000	11/15/99	6Y	
							PROJ.REVW.	HUD991026B	11/15/99	6Y	
099091	01-008392	1701 67TH AVE		OAKLAND	P	1917	PROJ.REVW.	HUD951113I	01/02/96	6Y	
099125	01-008406	1827 67TH AVE		OAKLAND	P	1925	PROJ.REVW.	HUD951121D	01/03/96	6Y	
095752	01-008303	1845 67TH AVE		OAKLAND	P	1923	PROJ.REVW.	HUD950210F	03/30/95	6Y	
084216	01-007384	2457 67TH AVE		OAKLAND	U	1924	PROJ.REVW.	HUD930812N	09/16/93	6Y	
082466	01-007030	2627 67TH AVE		OAKLAND	P	1935	PROJ.REVW.	HUD930513D	06/24/93	6Y	
101211	01-008428	2753 67TH AVE		OAKLAND	P	1925	PROJ.REVW.	HUD960201F	03/15/96	6Y	
103232	01-008521	2754 67TH AVE		OAKLAND			PROJ.REVW.	HUD960430C	08/19/96	6Y	
093589	01-001327	2936 67TH AVE	EVERGREEN CEMETERY MAUSOLEUM	OAKLAND	P	1917	HIST.SURV.	4623-4757-0000	09/30/95	3S	
							HIST.SURV.	4623-1682-0000	09/30/94	7R	
093590	01-001328	1125 67TH ST	SEALY MATTRESS COMPANY BUILDING	OAKLAND	P	1946	HIST.SURV.	4623-4758-0000	09/30/95	6Z	
							HIST.SURV.	4623-1683-0000	09/30/94	7R	
093591	01-001329	1165 67TH ST	JENSEN & NELSEN AUTO BODY FACTORY	OAKLAND	P	1923	HIST.SURV.	4623-1684-0000	09/30/94	7R	
093592	01-001330	1249 67TH ST	F.A.B. MANUFACTURING COMPANY FACTO	OAKLAND	P	1927	HIST.SURV.	4623-4759-0000	09/30/95	5S2	
							HIST.SURV.	4623-1685-0000	09/30/94	7R	
097261	01-008366	2507 68TH AVE		OAKLAND	P	1924	PROJ.REVW.	HUD950705O	08/31/95	6Y	
086648	01-007998	2639 68TH AVE		OAKLAND	P	1925	PROJ.REVW.	HUD931123D	01/12/94	6Y	
101958	01-008463	2648 68TH AVE		OAKLAND	P	1927	PROJ.REVW.	HUD960328E	04/24/96	6Y	
091714	01-008177	2707 68TH AVE		OAKLAND	P	1939	PROJ.REVW.	HUD940815A	10/04/94	6Y	
101957	01-008462	3422 68TH AVE		OAKLAND	P	1927	PROJ.REVW.	HUD960328F	04/24/96	6Y	
068696	01-005857	458 68TH ST	VICTORIAN ROW/ LEIMERT BLOCK	OAKLAND	U		PROJ.REVW.		03/13/80	2	AC
072926	01-006728	890 69TH AVE		OAKLAND	U	1925	PROJ.REVW.	HUD910823B	09/04/91	6Y	
089205	01-008091	944 69TH AVE		OAKLAND	P	1941	PROJ.REVW.	HUD940406J	04/27/94	6Y	
104044	01-008623	1515 69TH AVE		OAKLAND	P	1926	PROJ.REVW.	HUD960920E	10/03/96	6Y	
119325	01-010222	1749 69TH AVE		OAKLAND	P	1946	HIST.RES.	DOE-01-95-0084-0000	09/20/95	6U	
							PROJ.REVW.	HUD950920B	09/20/95	6U	
091103	01-008160	1820 69TH AVE		OAKLAND	P	1925	PROJ.REVW.	HUD940725G	08/29/94	6Y	

IMPACT SCIENCES | 20 YEARS

TELEPHONE LOG

CALLER: Sara Morton **DATE:** August 12, 2010 **TIME:** 1:30 PM

SUBJECT: **NWIC Record Search Results at 6701 San Pablo Avenue**

RECEIVED BY: Jillian E. Guldenbrein **TITLE:** Researcher

ORGANIZATION: **Northwest Information Center**

DEPARTMENT:

PHONE No.: **(707) 664-0880**

FAX No.:

Discussion Items

There are three recorded buildings at 1125, 1165, & 1249 67th Street. Jill could not identify exact locations of these buildings.

An architectural evaluation was conducted at the Marchant Building (Supernowicz 2006: S-32617). Based on this evaluation, the Marchant Building at 6701 San Pablo Avenue is a recorded historic-period building. Jill confirmed that the building was not included in the State Office of Historic Preservation's Historic Properties Directory. Jill stated that the architectural evaluation found that the building could be designated as 3S.

State Historic Preservation Officer Correspondence

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
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www.ohp.parks.ca.gov

REC'D OCT 14 2010

October 13, 2010

Reply in Reference To: DOE100920A

Mr. Kim Abbott
Cultural Resources Management Coordinator
Department of Energy, Office of Science
Berkeley Site Office
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS 90-1023
Berkeley, CA 94720

Re: Section 106 Consultation for Construction of Computational Research and Theory Facility, Lawrence Berkeley National Laboratory, Alameda County

Dear Mr. Abbott:

Thank you for initiating consultation regarding the Department of Energy's (DOE) efforts to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended, and its implementing regulation found at 36 CFR Part 800.

You have identified the undertaking as the construction of a three-story computational research and theory facility at Lawrence Berkeley National Laboratory. The approximately 126,000 square foot building will be constructed on a 2.25 acre parcel adjacent to the University of California campus.

In support of this undertaking, the DOE has submitted maps, evidence of tribal notification and the results of a records search and pedestrian archeological survey. No recorded cultural resources have been recorded within the project area but according to the information provided, there are three buildings adjacent to the site. After reviewing this information, I have the following comments:

1) Please provide a narrative project description including the extent and depth of all ground disturbance.

2) Please provide photographs and the dates of construction for Buildings 70, 70A and 50. If these buildings are over 45 years of age, please submit an evaluation for each structure using National Register Criteria.

3) Please provide a map and narrative justification of the project's Area of Potential Effect (APE). This should include a discussion of the project's potential visual effects.

Thank you for seeking my comments and considering historic properties as part of your project planning. If you have any questions or concerns, please contact Ed Carroll of my staff at (916) 445-7006 or at email at ecarroll@parks.ca.gov.

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

Department of Energy
Office of Science
Berkeley Site Office
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS 90-1023
Berkeley, California 94720

NOV 18 2010

Milford Wayne Donaldson
FAIA State Historic Preservation Officer
Office of Historic Preservation
California Department of Parks and Recreation
P.O. Box 942896
Sacramento, CA 94296-0001

Subject: Section 106 Consultation for Construction of Computational Research and Theory Facility, Lawrence Berkeley National Laboratory (LBNL)

Dear Mr. Donaldson:

In accordance with 36 CFR Part 800, the U.S. Department of Energy (DOE) Berkeley Site Office (BSO) requested your consultation regarding the undertaking of the construction of the Computational Research and Theory Facility at the Lawrence Berkley National Laboratory, Alameda County, California. In your October 13, 2010, response letter, reference DOE100920A DOE/BSO, you asked that we provide: 1) a narrative project description including the extent and depth of all ground disturbance; 2) photographs of and the dates of construction for Buildings 70, 70A and 50 and, if those buildings were over 45 years of age, to also submit an evaluation for each structure using National Register Criteria; and 3) a map and narrative justification of the project's Area of Potential Effect (APE) including a discussion of the project's potential visual effects.

As requested, we are enclosing a narrative project description and supporting figures (Enclosure 1), a narrative and justification of the APE for the Proposed Action (Enclosure 2), a map of the APE (Enclosure 3), and the photographs you requested of Buildings 70, and 70A (Enclosure 4). The APE for the Proposed Action includes Buildings 50, 70, 70A, 88, 65, 65A, and 65B.

LBNL consultant, Condor Country Consulting, conducted a records search for the Proposed Action with the Northwest Information Center of the California Historical Resources Information System at Sonoma State University's California Historical Resources Information

Center. According to the records search Buildings 50, 65, 65A, 65B, 70, 70A, and 88 are not recorded as archaeological sites/historic resources.

Building 50 was previously evaluated and determined not eligible for inclusion in the National Register of Historic Places (see Enclosure 5).

Buildings 65A and B are not eligible for inclusion in the National Register of Historic Places because they are not over 45 years old (built in 1984 and 1983) and therefore not eligible. Building 65 was built in 1952. Building 65 is an administrative building and has no association with any events or the lives of persons of significance in our history. In addition, none of the architectural and engineering elements of these buildings embody unique or significant design characteristics. Enclosure 6 shows the photographs of Building 65.

Although Buildings 70 and 70A have some associations with Nobel laureates and other prominent Laboratory scientists and researchers, much of their hands-on scientific work occurred in other research facilities. Building 70 was constructed in 1955 and Building 70A was constructed in 1961. The architectural elements, and scientific and engineering features of these buildings have been altered to the extent that they have lost any historical integrity. In addition, none of the architectural and engineering elements of these buildings embodies unique or significant design characteristics. Enclosure 4 shows the photographs you requested of Buildings 70 and 70A.

Building 88, constructed between 1958 and 1962, may be eligible for inclusion in the National Register of Historic Places under the National Register criteria for evaluation (a) and criteria considerations (g). The APE for Building 88 would be the interior of the building because the potential significance for Building 88 lies in the scientific accomplishments or events that took place within the facility. The APE for Building 88 would therefore not be affected by the construction of the Proposed Action.

We hope that after you have had an opportunity to review this letter and the attached materials, you will concur with our determination that, in accordance 36 CFR Chapter 1 Part 60.4, Buildings 65, 70, and 70A are not eligible under the National Register criteria for evaluation (a), (b), or (c), that criterion (d) is not applicable, and that Buildings 65, 70, and 70A are not eligible for inclusion in the National Register of Historic Places, that the Proposed Action will not affect the APE of Building 88 and that DOE's proposed action will not affect historic properties.

If you have any questions, please contact Kim Abbott at (510) 486-7909, or email him at kim.abbott@bso.science.doe.gov.

Sincerely,

Aundra Richards

Aundra Richards
Site Manager
Berkeley Site Office

Enclosure:
(1) Narrative Project Description and supporting figures
(2) Narrative and Justification of the APE for the Proposed Action
(3) Map of the APE for the Proposed Action
(4) Photos of Buildings 70 and 70A
(5) Office of Historic Preservation Department of Parks and Recreation Letter dated August 8, 2007
(6) Photos of Buildings 65, 65A and B

cc:
Kim Abbott, BSO
Jeff Philliber, LBNL
Pat Burke, CH GLD
Katatra Vasquez, ORO

Enclosure (1) Narrative Project Description

The U.S. Department of Energy (DOE) proposes to relocate and consolidate all Advanced Scientific Computing Research (ASCR)-funded LBNL programs in one location on the Lawrence Berkeley National Laboratory (LBNL) site. The programs will be relocated into a new three-story building that will be constructed at LBNL by the University of California (UC or University). The new building will be called the Computational Research and Theory (CRT) facility.

The new three-story building would consist of a 2,973 square meters (32,000 gross square feet (gsf)) high performance computer (HPC) floor with a high ceiling and two additional floors of office space for a total 11,706 square meters (126,000 gross square feet) of space. The two floors above the HPC floor would provide a variety of general office, computer configuration and support, software support, videoconferencing, meeting and visualization laboratory spaces.

The site for the proposed building is 0.91-hectare or 2.25 acres in total area and is located adjacent to Cyclotron Road and Chu Road. Construction access to the project site would be via Cyclotron Road, Chu Road, and a new access driveway from Chu Road. Parking for construction workers would be provided off site, and buses would transport construction workers to the project site. Staging areas would be established where feasible on the project site.

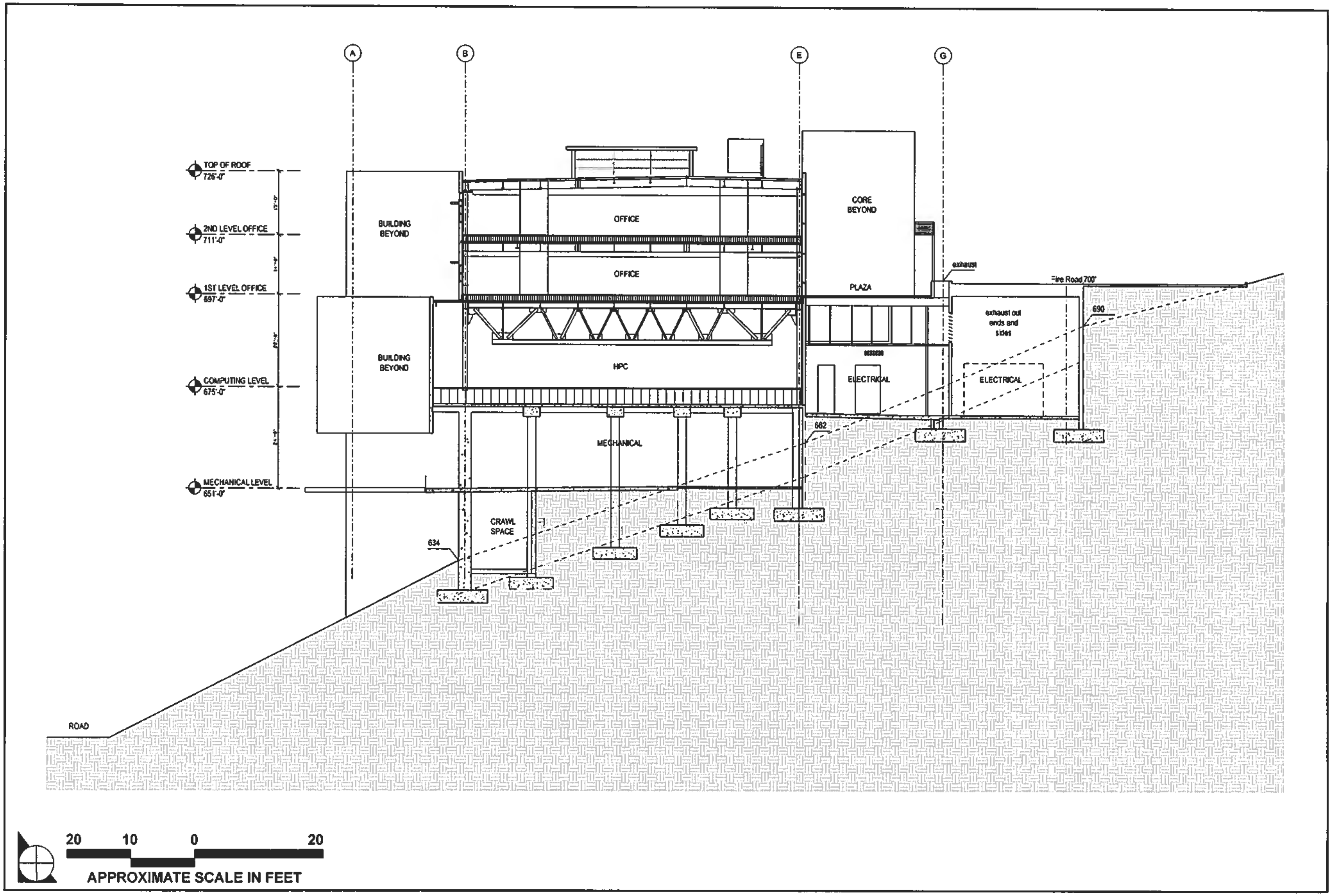
The entire 2.25-acre site (see **Figure 3.0-2**) will be disturbed during project construction. Because of the hillside location of the proposed building, project construction will involve both cuts and fills. The depth of excavation will vary. **Figure 3.0-4** shows a cross section of the proposed building and depths to which the piers will extend below the building. The depth of excavation for building construction will vary from 0 to 30 feet below existing grade. Utility trenching will not exceed 20' in depth.

Enclosure (2). APE Narrative and Justification

The horizontal Area of Potential Effect (APE) map is attached. This encompasses the APE for both archaeological resources and built environment features. The archaeological resources APE is defined as including all areas that would be subject to ground disturbance under the Proposed Action. The APE for the built environment features was defined to include the first set of buildings adjacent to the project site. Other LBNL buildings beyond the first set of buildings would not be directly or indirectly affected by the construction of the proposed building. Note that the project site is located within the LBNL site on land owned by the University of California and is surrounded on all sides by University-owned land.

The vertical APE is defined to include all areas that will be excavated within the horizontal APE. As shown in **Figure 3.0-4**, the depth of the APE is between 1 and 30 feet of excavation.

The Proposed Action's visual effects are described in the Environmental Assessment. As that analysis shows, due to grade changes, intervening topography and vegetation, the proposed building would not be visible from most off-site locations. In addition, as discussed in the cover letter, with the exception of Building 88, none of the buildings in the immediate vicinity of the proposed CRT building are considered eligible for the National Register and therefore the construction of the proposed building would not affect the context or the setting of any potential historic structures. As discussed in the letter, although Building 88 may potentially be eligible for listing, its eligibility stems not from the design or the exterior appearance of the building but from activities that were conducted inside the building. Therefore, construction of the CRT building should not detract from the historical significance of Building 88.



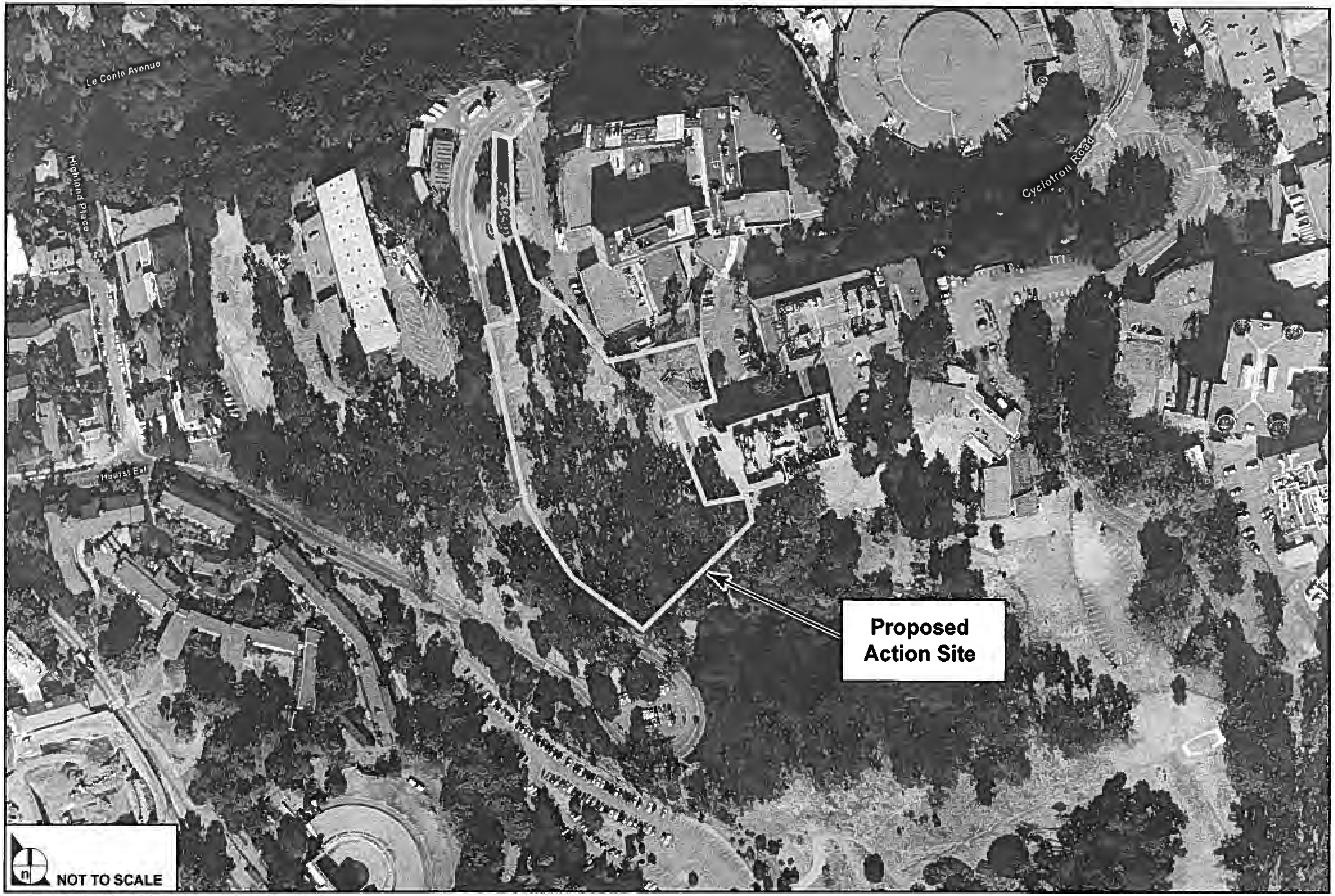
SOURCE: Perkins & Will – January 2010

43

FIGURE 3.0-4

CRT Facility Section

924-006•02/10

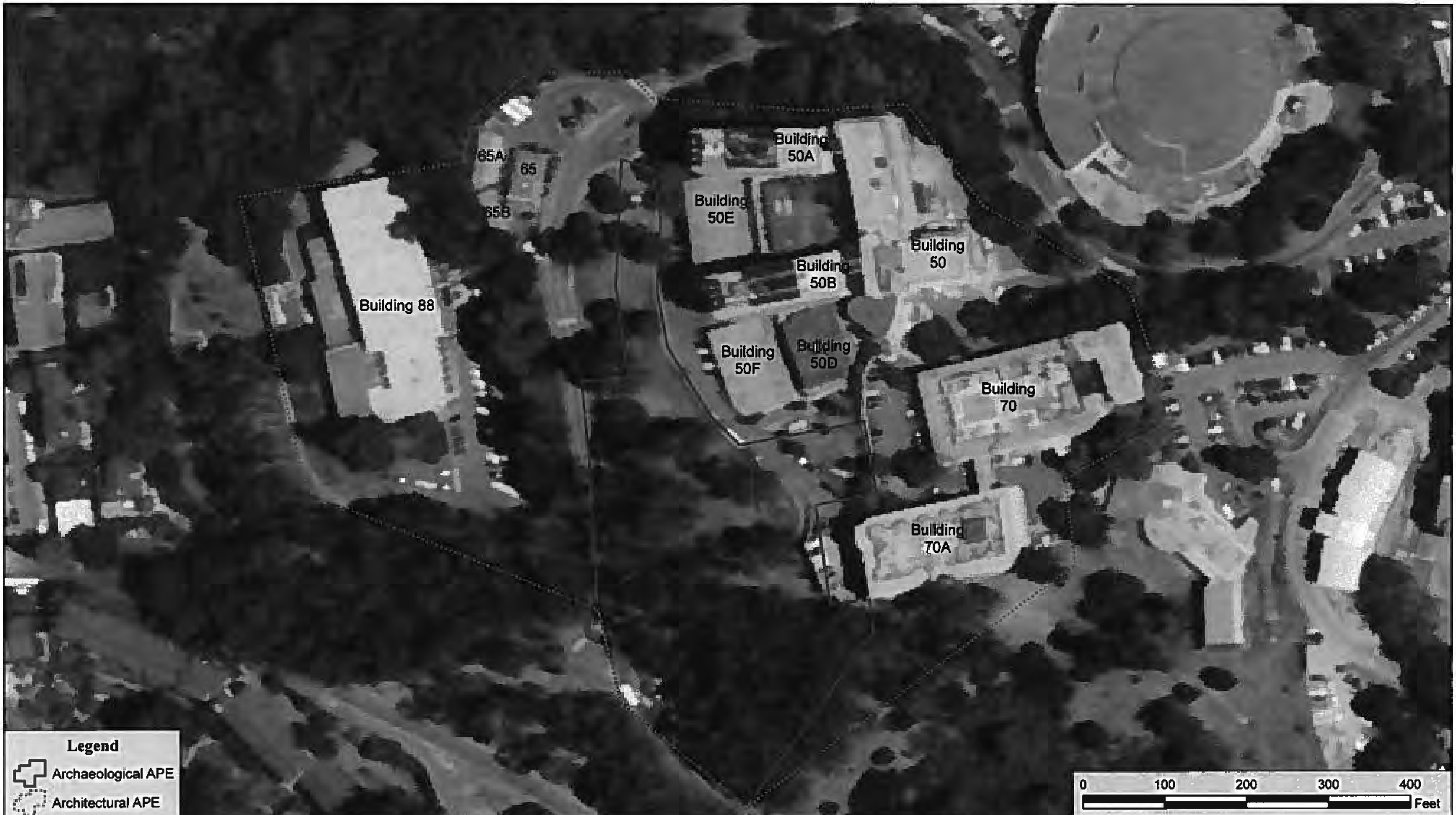


44 SOURCE: Google Earth - July 2007, Perkins+Will - September 2007

FIGURE 3.0-2

Approximate Proposed Action Site

924-006-02/10



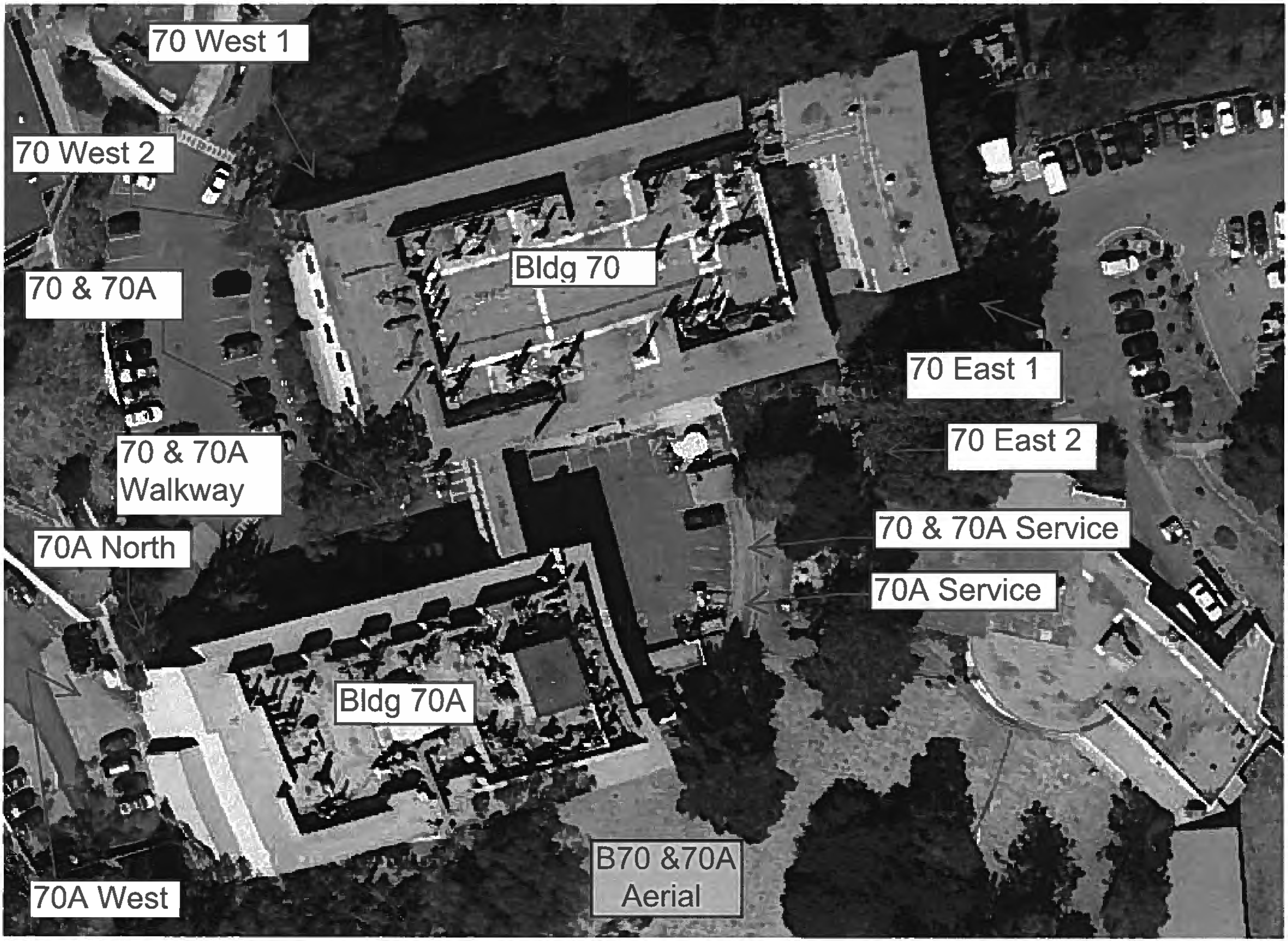
CONDOR COUNTRY CONSULTING, INC.

BERKELEY LAB
LAWRENCE BERKELEY NATIONAL LABORATORY

AREA OF POTENTIAL EFFECTS MAP (ARCHAEOLOGY & ARCHITECTURAL HISTORY)

COMPUTATIONAL RESEARCH AND THEORY FACILITY PROJECT

FEDERAL ID NO: DOE EA#1700	FIGURE 1	DATE: November 2010	SHEET 1 OF 1


70 West 1
70 West 2
70 & 70A
Bldg 70
70 East 1
70 & 70A
Walkway
70 East 2
70 & 70A Service
70A North
70A Service
Bldg 70A
B70 &70A
Aerial
70A West

70 East 2

70 East 1


70
70 West 2


70 & 70A

70A North


70 & 70A Walkway

70 West 1


70A West

70 & 70A Service

70A Service

STATE OF CALIFORNIA – THE RESOURCES AGENCY
ARNOLD SCHWARZENEGGER, Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
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calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

8 August 2007

REPLY TO: DOE070609A

Audra Richards, Site Manager
Department of Energy
Berkeley Site Office
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS 90-1023
Berkeley, CA 94720

Re: Section 106 Conference for Determination of Eligibility of Building 50, Lawrence Berkeley National Laboratory (LBNL), Berkeley, Alameda County, CA

Dear Ms. Richards:

Thank you for initiating consultation with me pursuant to 36 CFR Part 800, the regulation that implements Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended, and other applicable regulations. Your letter of 16 July 2007 requests that I concur with the determination that Building 50 is not eligible for inclusion in the National Register of Historic Places (NRHP).

Building 50 housed the Ernest Orlando Lawrence Berkeley National Laboratory Directorate and most of the lab's administrative office. It also provided office and research facilities for some of the lab's most important scientists and Nobel Prize laureates, and became the center of high-energy physics research at LBNL. The building is significant for these associations; however, it does not retain sufficient integrity to convey its significance. Since its original construction in 1949, there have been six additions to Building 50 and the original design and appearance has been significantly altered.

Because of the loss of integrity, DOE has determined that Building 50 **is not eligible** for inclusion in the NRHP. I concur with this determination.

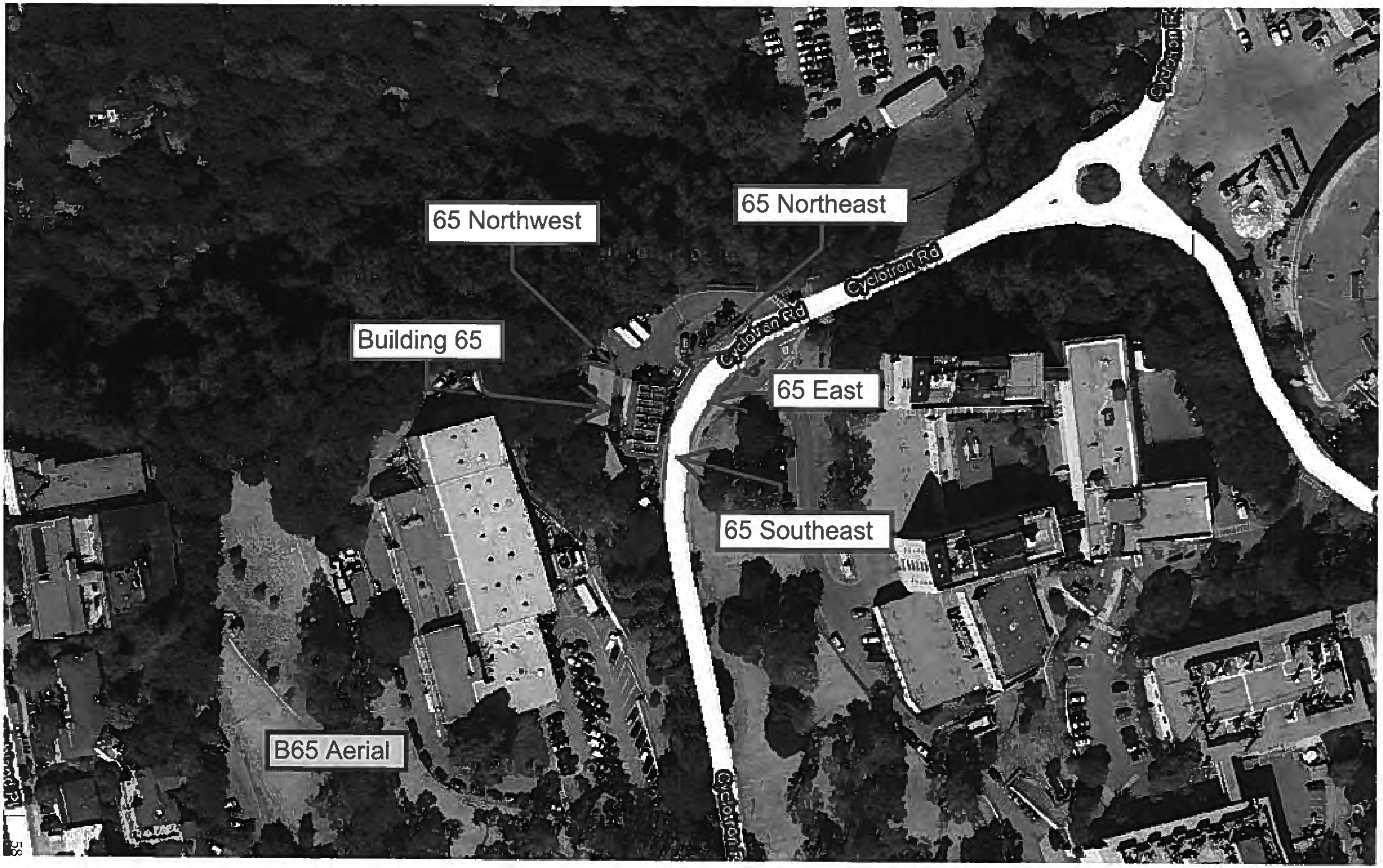
Thank you for the opportunity to comment on this undertaking. If you have any questions about my comments, please contact staff architectural historian Amanda Blosser at (916) 653-9010 or at ablosser@parks.ca.gov.

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

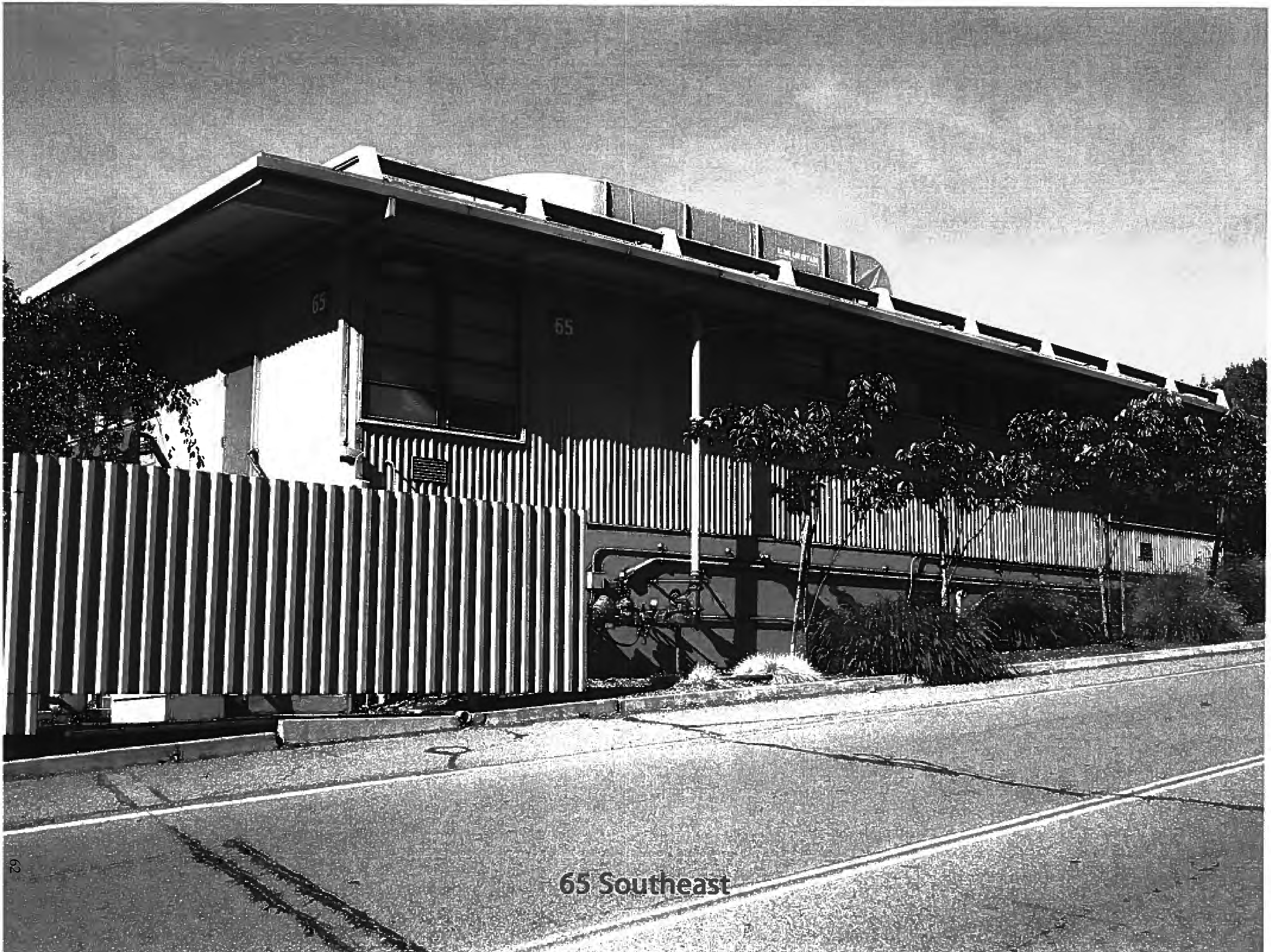
MWD:ab


65 Northwest
65 Northeast
Building 65
65 East
65 Southeast
B65 Aerial
Cyclotron Rd
Cyclotron Rd
Cyclotron Rd

65 Northwest

65 East

65 Northeast



65 Southeast

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calshpo@parks.ca.gov
www.ohp.parks.ca.gov

REC'D DEC 14 2010

December 10, 2010

Reply in Reference To: DOE100920A

Mr. Kim Abbott
Cultural Resources Management Coordinator
Department of Energy, Office of Science
Berkeley Site Office
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS 90-1023
Berkeley, CA 94720

Re: Section 106 Consultation for Construction of Computational Research and Theory Facility, Lawrence Berkeley National Laboratory, Alameda County

Dear Mr. Abbott:

Thank you for continuing consultation regarding the Department of Energy's (DOE) efforts to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended, and its implementing regulation found at 36 CFR Part 800.

I am writing in response to your 18 November 2010 letter addressing my requests for additional information regarding the above referenced project. According to the information provided, DOE is proposing to construct a 126,000 square foot three-story computational research and theory facility. Construction will require a new access driveway and excavation for piers and utilities to a maximum of 30 feet below grade over the entire 2.25-acre project area.

The results of a records search and pedestrian survey did not identify the presence of any archeological resources within the project area, however according to the search results, the project area "has been highly developed" subsequently obscuring the "the visibility of original surface soils, which negates the feasibility of an adequate surface inspection." An assessment of adjacent buildings and structures identified Buildings 50 (A-E), 65, 65A, 65B, 70, 70A and 88 as being within the project's Area of Potential Effect (APE). Building 50, constructed in 1949, was determined ineligible for National Register (NRHP) listing through consensus with my office in 2007. Buildings 65, 70 and 70A, constructed in 1952, 1955 and 1961 respectively, are older than 50 years of age and have incurred extensive modifications since their construction. Furthermore, pending further evaluation, Building 88 may be eligible for NRHP listing under Criteria A and g but the building's significance will not be affected by this project.

DOE is requesting my concurrence with their determinations that Buildings 65, 70 and 70A are *not* eligible for listing in the NRHP, that Building 88 will not be affected by this project as proposed and that no historic properties will be affected by this project. After reviewing the accompanying documentation, including tribal consultation, maps, photographs, and the following document: *Environmental Assessment for the Computational Research and Theory Facility Project* (September 2010), I have the following comments:

1) I concur that the APE has been properly determined and documented pursuant to 36 CFR Parts 800.4 (a)(1) and 800.16(d).

2) I concur that Buildings 65, 70 and 70A are *not* eligible for NRHP listing.

3) I concur that Building 88's historic significance will not be affected by this project as proposed.

4) Section 4.2.5 (page 19) of the Environmental Assessment you submitted in support of this project addresses your efforts to identify cultural resources within the project area. This assessment quotes a records search from the Northwest Information Center as indicating there is a "low potential for Native American sites in the project area" and as a result "a low possibility of identifying Native American or historic–period archeological deposits in the project area." Conversely, the accompanying records search results (in the same document) from the Northwest Information Center clearly states that "there is a moderate to high possibility of identifying Native American archeological resources and a moderate possibility of identifying historic-period archeological resources in the project area." In the interest of clarification and pursuant to 36 CFR Part 800.4, I recommend that a qualified archeologist conduct geoarcheological studies in *all* areas of planned ground disturbance, inclusive of utility trench lines and pier excavation. Once completed, a report and summary should be sent to my office for review in order to continue this consultation.

5) I am currently unable to concur with your finding of no historic properties affected.

Thank you for seeking my comments and considering historic properties as part of your project planning and I look forward to continuing consultation with DOE for this project. If you have any questions or concerns, please contact Ed Carroll of my staff at (916) 445-7006 or at email at ecarroll@parks.ca.gov.

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

Department of Energy
Office of Science
Berkeley Site Office
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS 90-1023
Berkeley, California 94720

DEC 21 2010

Milford Wayne Donaldson
FAIA-State Historic Preservation Officer
Office of Historic Preservation
California Department of Parks and Recreation
1725 23rd Street, Suite 100
Sacramento, CA 95816-7100

Subject: Section 106 Consultation for Construction of Computational Research and Theory Facility (CRT) Lawrence Berkeley National Laboratory (LBNL)

Dear Mr. Donaldson:

We received your December 10, 2010, letter (reference DOE100920A) in which you recommended that we obtain a qualified archeologist to conduct a geoarcheological study in areas of planned ground disturbance and submit a report for your office to review in order to continue this consultation.

Your request was based on the fact the draft Environmental Assessment (EA) contained a records search from the Northwest Information Center that states that "there is a moderate to high possibility of identifying historic-period archeological resources in the project area." This report was prepared for the Richmond Field Station (RFS) site, which is identified in the draft EA as one of the alternate sites for construction of the CRT. We agree that the RFS would require additional studies to determine if historic properties would be affected if that were the proposed site for the project. However, as described elsewhere in the EA, the site that we have selected for the proposed action is the LBNL site, not the RFS.

With respect to the proposed action site where we are actually proposing to build the CRT (the area at LBNL below building 50), the draft EA page 4.0-19 section 4.2.5 notes that there is a "low potential for Native American sites in the project area." Since the proposed action site has a low potential for Native American sites, we believe that no further studies are required for this site.

We therefore request your concurrence for constructing the CRT at the LBNL site below building 50 so that we can complete the consultation without having to conduct additional studies. If the RFS site is selected, then we will resume consultation and conduct the additional studies you requested.

If you have any questions, please contact Kim Abbott at (510) 486-7909, or email him at kim.abbott@bso.science.doe.gov.

Sincerely,

C. D. Amaden for

Aundra Richards
Site Manager
Berkeley Site Office

cc:
K. Abbott, BSO
J. Philliber, LBNL
P. Burke, OCC
K. Vasquez, ORO

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
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www.ohp.parks.ca.gov

January 18, 2011

Reply in Reference To: DOE100920A

Mr. Kim Abbott
Cultural Resources Management Coordinator
Department of Energy, Office of Science
Berkeley Site Office
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS 90-1023
Berkeley, CA 94720

Re: Section 106 Consultation for Construction of Computational Research and Theory Facility, Lawrence Berkeley National Laboratory, Alameda County

Dear Mr. Abbott:

You are continuing consultation regarding the Department of Energy's (DOE) efforts to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended, and its implementing regulation found at 36 CFR Part 800.

Thank you for your 21 December 2010 letter addressing my requests for clarification of previously submitted documentation for the above referenced project. It is my understanding that DOE is proposing to construct a 126,000 square foot three-story computational research and theory facility that will require excavation for piers and utilities to a maximum of 30 feet below grade over the entire 2.25-acre project area.

The results of a records search and pedestrian survey did not identify the presence of any archeological resources within the project area, and according to results from a records search conducted at the Northwest Information Center, there is a low possibility of encountering subsurface resources during project activities. At this time, DOE is requesting my concurrence with their determination that this project as proposed will result in no historic properties affected. After reviewing the accompanying documentation, including tribal consultation, maps, photographs, and the following document: *Environmental Assessment for the Computational Research and Theory Facility Project* (September 2010), I concur with your finding of no historic properties affected. Please be advised that under certain circumstances, such as an unanticipated discovery or a change in project description, you may have future responsibilities for this undertaking under 36 CFR Part 800.

Thank you for seeking my comments and considering historic properties as part of your project planning. If you have any questions or concerns, please contact Ed Carroll of my staff at (916) 445-7006 or at email at ecarroll@parks.ca.gov.

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

Lawrence Berkeley National Laboratory
Computational Research and Theory Facility
Project Summary

PROPOSED ACTION:

This undertaking would include demolishing and relocating a portion of the Seaborg stairway that extends from Chu Road to the Building 50 parking lot at Lawrence Berkeley National Laboratory (LBNL).

The Seaborg stairway is an exterior wooden staircase spanning approximately 350 feet of steep hillside at LBNL. Its rustic construction consists of treated lumber joined with metal fasteners and set on piers on poured concrete footings. It has been repaired and modified several times throughout its lifetime, and was entirely replaced in 1999. It is not accessible to the general public as it is within LBNL's security perimeter.

LOCATION OF ACTION:
The stairway is located in the northwestern area of the Lab ("Blackberry Cluster"), and leads up from Chu Road to the Building 50 complex within the Lab's heavily developed "Research and Academic" zone as identified in the LBNL 2006 Long Range Development Plan.

DISCUSSION:
The DOE Berkeley Site Office (BSO) has determined that the subject stairway is not eligible for inclusion in the National Register of Historic Places based on application of the Criteria for Evaluation identified in the National Historic Preservation Act (NHPA). These Criteria help to establish whether a particular resource is associated with an important historic context and/or whether it retains historic integrity of those physical features necessary to convey its significance. Although the stairway is named after a Nobel Laureate, Glen Seaborg, there is no known specific association between Dr Seaborg and the stairway. The Criteria are as follows:

> A facility under consideration must possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
> A) be associated with events significant to broad patterns of our history; or
> B) be associated with the lives of people significant to our past; or
> C) embody distinctive physical characteristics associated with history or architecture; or
> D) yield (or be likely to yield) information important to history or pre-history. The stairway was entirely reconstructed in 1999, but it has been maintained and modified in several decades preceding that. The stairway is unremarkable from an architectural standpoint. Accordingly, it does not meet Criteria A, B, C, or D.

DETERMINATION:
The DOE Berkeley Site Office (BSO) has determined that the stairway is not eligible for inclusion in the National Register of Historic Places. Further, and in accordance with 36 CFR

Part 800.3(a)(1), BSO determines that the demolition and relocation of a portion of the stairway does not have the potential to cause effects on historic properties; therefore, the DOE has no further obligations under section 106 or 36 CFR Part 800.3.

K. Abbott

Kim Abbott
Berkeley Site Office
Environmental Program Manager

8/11/2010

APPENDIX 3

Air Quality Emissions Results

5.1 BAAQMD THRESHOLDS

Table A-1
BAAQMD CEQA Thresholds
Construction-Related Activities

Pollutant/Parameter	Proposed Threshold of Significance
Reactive Organic Gas (ROG) Emissions	54 lbs/day
Nitrogen Oxide (NO_x) Emissions	54 lbs/day
Particulate Matter (10 micron) (PM_{10}) Emissions	82 lbs/day
Particulate Matter (2.5 micron) ($PM_{2.5}$) Emissions	54 lbs/day
Fugitive Dust	Best Management Practices
Lifetime Excess Cancer Risk	10-in-a-million
Non-Cancer Hazard	1.0
$PM_{2.5}$ Annual Average Ambient Concentration	0.3 μg/m^3

Source: BAAQMD 2009

Table A-2
BAAQMD CEQA Thresholds
Operation-Related Activities

Pollutant/Parameter	Proposed Threshold of Significance
Reactive Organic Gas (ROG) Emissions	54 lbs/day; 10 tons/yr
Nitrogen Oxide (NO_x) Emissions	54 lbs/day; 10 tons/yr
Particulate Matter (10 micron) (PM_{10}) Emissions	82 lbs/day; 15 tons/yr
Particulate Matter (2.5 micron) ($PM_{2.5}$) Emissions	54 lbs/day; 10 tons/yr
Fugitive Dust	54 lbs/day; 10 tons/yr
Carbon Monoxide (CO) Ambient Concentration	9.0 ppm (8-hr); 20.0 ppm (1-hr)
Lifetime Excess Cancer Risk	10-in-a-million [a]

Pollutant/Parameter	Proposed Threshold of Significance
Non-Cancer Hazard	1.0 [a]
$PM_{2.5}$ Annual Average Ambient Concentration	0.3 μg/m^3 [a]
Odors	Screening Level distance or complaint history

a Or compliance with a Qualified Community Risk Reduction Plan adopted by the local jurisdiction with enforceable measures to reduce the community risk.
Note: Greenhouse gas thresholds are described in Section 5.9, Greenhouse Gas Emissions.
Source: BAAQMD 2009

5.2 PROPOSED ACTION

Methodology

The emissions from mobile sources and area sources were estimated using URBEMIS2007, in accordance with emission factors and parameters recommended by the BAAQMD. A boiler would operate on-site and would have a heat input rating of 0.9 million British thermal units per hour, which is generally considered to be a small industrial boiler. As a conservative measure, it was assumed the boiler would operate every day for 24 hours. Emission factors were obtained from the U.S. Environmental Protection Agency's (US EPA) AP 42 (US EPA 1995). Emissions of NO_X were assumed to meet 30 parts per million (ppm), in accordance with Best Available Control Technology (BACT).

Criteria pollutant emissions associated with the emergency generators were calculated using emission standards for off-road diesel (compression-ignition) engines established by the California Air Resources Board (CARB) and the US EPA. Because the engines would have an output rating greater than 50 horsepower, these units must comply with CARB's Airborne Toxics Control Measure (ATCM) for stationary compression-ignition engines. The ATCM requires that new emergency standby engines must comply with hydrocarbon, NO_X, and CO limits that are applicable to an off-road engine of the same model year and horsepower rating. The ATCM further limits the PM emissions from an emergency standby engine to either (1) 0.15 gram per horsepower-hour (g/hp-hr) (with a maximum operating limit of 50 hours per year for testing and maintenance) or 0.01 g/hp-hr (with a maximum operating limit of 100 hours per year for testing and maintenance), or (2) the emission limit for an off-road engine with the same maximum rated power, whichever is more stringent. For the ratings of the proposed engines, assuming a 2010 model year or later, the 0.15 g/hp-hr limit is the applicable PM limit under California and federal standards for off-road engines; however, UC LBNL has proposed to use engines that meet more stringent emission standards. UC LBNL has also proposed to restrict the operating hours to 50 hours per year for testing and maintenance. Since June 2006, the sulfur content of available CARB diesel fuel has been 15 ppm (0.0015 percent) by weight, and this concentration was used to estimate the sulfur oxide (SO_X) emissions from the proposed engines.

The proposed project would operate five cooling towers with a maximum circulating water flow rate of 1,465 gallons per minute and a standard flow rate of 735 gallons per minute. The emissions associated with daily operation of the cooling towers were calculated using the maximum flow rate to represent a worst-case day scenario. The emissions associated with cooling towers were calculated using emission factors contained US EPA's AP 42 (US EPA 1995).

Results

Table A-3
Estimated Proposed Action Construction Emissions

	Emissions in Tons per Year					
Year	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
2010	0.18	1.51	0.79	0.00	0.83	0.23
2011	0.19	1.29	1.83	0.00	0.08	0.07
2012	0.18	1.19	1.73	0.00	0.08	0.07
2013	1.51	0.99	1.17	0.00	0.07	0.06
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Table A-4
Modeled $PM_{2.5}$ Concentrations (Construction)

Emissions Source	Averaging Period	Maximum Concentration (micrograms per cubic meter)	LECR	Chronic Hazard Index
Grading/Trenching	Annual	0.022	0.9	0.004
Building Construction	Annual	0.018	0.7	0.004
BAAQMD Thresholds	Annual	0.3	10	1.0
Exceeds Threshold?		NO	NO	NO

Source: Impact Sciences, Inc.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Table A-5
Estimated Proposed Action Operational Emissions

Emissions Source	Emissions in Tons per Year					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Stationary Sources						
Boiler	0.02	0.14	0.32	0.00	0.03	0.03
750 kW Generator[1]	0.00	0.29	0.01	0.00	0.00	0.00
750 kW Generator[1]	0.00	0.29	0.01	0.00	0.00	0.00
Cooling Towers	--	--	--	--	0.05	0.05
Operational (Mobile) Sources	0.52	0.49	4.63	0.00	0.84	0.16
Area Sources	0.15	0.15	0.27	0.00	0.00	0.00
Emission Totals	0.69	1.36	5.24	0.00	0.92	0.24
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	-

Source: Impact Sciences, Inc.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.
[1] *Assumes 50 hours per year for testing and maintenance.*
kW = kilowatt

Table A-6
Modeled $PM_{2.5}$ Concentrations (Operational)

Emissions Source	Averaging Period	Maximum $PM_{2.5}$ Concentration (micrograms per cubic meter)
Stationary/Area Sources	Annual	0.016
BAAQMD Thresholds	Annual	0.3
Exceeds Threshold?		NO

Source: Impact Sciences, Inc.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Table A-7
Summary of Maximum Modeled Cancer Risks

Receptor	Cancer Risk
On-Site	
Worker	0.04×10^{-5}
Off-Site	
Child/Adult Resident	0.04×10^{-5}

Source: Golder Associates 2007; Impact Sciences 2010

Table A-8
Summary of Maximum Modeled Chronic Noncancer Health Impacts

Receptor	Chronic Hazard Index
On-Site	
Worker	0.004
Off-Site	
Resident	0.0004

Source: Golder Associates 2007; Impact Sciences 2010

5.3 ALTERNATIVE 1, CAFETERIA PARKING LOT SITE

Table A-9
Estimated Construction Emissions – Alternative 1

	Emissions in Tons per Year					
Year	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
2010	0.15	1.30	0.68	0.00	0.20	0.09
2011	0.19	1.29	1.83	0.00	0.08	0.07
2012	0.18	1.19	1.73	0.00	0.08	0.07
2013	1.51	0.99	1.17	0.00	0.07	0.06
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Table A-10
Estimated Operational Emissions – Alternative 1

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Stationary Sources						
Boiler	0.02	0.14	0.32	0.00	0.03	0.03
750 kW Generator[1]	0.00	0.29	0.01	0.00	0.00	0.00
750 kW Generator[1]	0.00	0.29	0.01	0.00	0.00	0.00
Cooling Towers	—	—	—	—	0.05	0.05
Operational (Mobile) Sources	0.52	0.49	4.63	0.00	0.84	0.16
Area Sources	0.15	0.15	0.27	0.00	0.00	0.00
Emission Totals	0.69	1.36	5.24	0.00	0.92	0.24
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.
[1] Assumes 50 hours per year for testing and maintenance.

5.4 ALTERNATIVE 2, RFS SITE

Table A-11
Estimated Construction Emissions – Alternative 2

	Emissions in Tons per Year					
Year	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
2010	0.18	1.51	0.79	0.00	0.29	0.11
2011	0.19	1.29	1.83	0.00	0.08	0.07
2012	0.18	1.19	1.73	0.00	0.08	0.08
2013	1.51	0.99	1.17	0.00	0.07	0.06
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Table A-12
Estimated Operational Emissions – Alternative 2

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Stationary Sources						
Boiler	0.02	0.14	0.32	0.00	0.03	0.03
750 kW Generator[1]	0.00	0.29	0.01	0.00	0.00	0.00
750 kW Generator[1]	0.00	0.29	0.01	0.00	0.00	0.00
Cooling Towers	—	—	—	—	0.05	0.05
Operational (Mobile) Sources	1.16	1.09	10.30	0.01	1.87	0.36
Area Sources	0.15	0.15	0.27	0.00	0.00	0.00
Emission Totals	1.33	1.96	10.91	0.01	1.95	0.44
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.
[1] Assumes 50 hours per year for testing and maintenance.

5.5 ALTERNATIVE 3, FORMER DHS SITE

Table A-13
Estimated Construction Emissions – Alternative 3

	Emissions in Tons per Year					
Year	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
2010	0.18	1.51	0.79	0.00	0.16	0.09
2011	0.19	1.29	1.83	0.00	0.08	0.07
2012	0.18	1.19	1.73	0.00	0.08	0.08
2013	1.51	0.99	1.17	0.00	0.07	0.06
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Table A-14
Estimated Operational Emissions – Alternative 3

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Stationary Sources						
Boiler	0.02	0.14	0.32	0.00	0.03	0.03
750 kW Generator[1]	0.00	0.29	0.01	0.00	0.00	0.00
750 kW Generator[1]	0.00	0.29	0.01	0.00	0.00	0.00
Cooling Towers	—	—	—	—	0.05	0.05
Operational (Mobile) Sources	0.88	0.83	7.81	0.00	1.42	0.27
Area Sources	0.15	0.15	0.27	0.00	0.00	0.00
Emission Totals	1.05	1.70	8.42	0.00	1.50	0.35
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.
[1] *Assumes 50 hours per year for testing and maintenance.*

5.6 ALTERNATIVE 4, LEASED FACILITY ON SAN PABLO AVENUE

Table A-15
Estimated Construction Emissions – Alternative 4

	Emissions in Tons per Year					
Year	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
2010	0.05	0.35	0.49	0.00	0.02	0.02
2011	0.19	1.29	1.83	0.00	0.08	0.07
2012	0.18	1.19	1.73	0.00	0.08	0.08
2013	1.43	0.54	0.82	0.00	0.03	0.03
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.
[1] *Assumes 50 hours per year for testing and maintenance.*

Table A-16
Estimated Operational Emissions – Alternative 4

	Emissions in Tons per Year					
Emissions Source	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Stationary Sources						
Boiler	0.02	0.14	0.32	0.00	0.03	0.03
750 kW Generator[1]	0.00	0.29	0.01	0.00	0.00	0.00
750 kW Generator[1]	0.00	0.29	0.01	0.00	0.00	0.00
Cooling Towers	—	—	—	—	0.05	0.05
Operational (Mobile) Sources	1.02	0.96	9.07	0.01	1.64	0.31
Area Sources	0.15	0.15	0.27	0.00	0.00	0.00
Emission Totals	1.19	1.83	9.68	0.01	1.72	0.39
De minimis levels	100	100	100	100	100	--
Exceeds de minimis level?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.
[1] *Assumes 50 hours per year for testing and maintenance.*

5.7 ALTERNATIVE 5, NO ACTION

Table A-17
Estimated Operational Emissions – Alternative 5

Emissions Source	Emissions in Tons per Year					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Operational (Mobile) Sources	0.27	0.20	2.14	0.00	0.40	0.07
Area Sources	0.10	0.09	0.33	0.00	0.00	0.00
Emission Totals	0.37	0.29	2.47	0.00	0.40	0.08
De minimis levels	100	100	100	100	100	--
Exceeds de minimis levels?	NO	NO	NO	NO	NO	--

Source: Impact Sciences, Inc.
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

APPENDIX 4

Comments on the Draft EA and DOE Responses

APPENDIX 4

TABLE OF CONTENTS

Introduction

INTRODUCTION

The Draft Environmental Assessment (EA) for the Computational Research and Theory (CRT) facility at the Lawrence Berkeley National Laboratory (LBNL) was distributed for review and comment on September 14, 2010. This Appendix summarizes public and agency comments received during the 30-day public comment period and responses to those comments. Public agency comments are presented in their original format in the **Public Agency Comments** section**,** at the end of this appendix. All agencies, organizations, and individuals who commented on the Draft EA are listed below.

Commenters on the Draft EA

Public Agencies

- East Bay Municipal Utility District (EBMUD), William Kirkpatrick (October 15, 2010)
- Bay Area Air Quality Management District, Jean Roggenkamp (October 18, 2010)

Organizations

- Building & Construction Trades Council of Alameda County, Andreas Cluver (October 4, 2010)
- Committee to Minimize Toxic Waste, Pamela Sivhola (October 15, 2010)
- Committee to Minimize Toxic Waste, Gene Bernardi (September 20 and October 15, 2010)
- Hills Conservation Network, Dan Grassetti, (October 15, 2010)
- Hills Conservation Network, Madeline Hovland (October 15, 2010)
- Nyingma Institute, Sylvia Gretchen (October 14, 2010)
- Save Strawberry Canyon, Lesley Emmington Jones (October 14, 2010)
- Save Strawberry Canyon, Zee Hakimoglu (October 9, 2010)
- Strawberry Creek Watershed Council, Carole Schemmerling (October 18, 2010)

Individuals

- Curtis, Garniss (October 15, 2010)
- Eiseley, Jane, (October 11, 2010)
- Fairfield, Richard (October 15, 2010)
- Legg, Victoria (October 9, 2010)

- Matis, Howard (September 20, 2010)
- Miller, Tom (October 9, 2010)
- Sarachan, Laurie (October 12, 2010)
- Scott, Peter (October 14, 2010)
- Sharp, JM (October 15, 2010)
- Taylor, Matthew (October 9, 2010)
- Thompson, Daniella (October 15, 2010)
- Woodcock, Charlene (October 18, 2010)

Responses to all comments are provided in the **Response to Comments Matrix,** in this Appendix, alongside a summary of each corresponding comment. To provide a more detailed response to an issue of particular concern to the public, this Appendix also includes "Master Responses," in the following section**.**

MASTER RESPONSES

Master Response 1 – Geological Conditions Underlying the LBNL Site

Many public comments on the CRT Facility Draft EA state or suggest that no more buildings should be constructed at the Lawrence Berkeley National Laboratory (LBNL) site due to the unstable geological conditions of the LBNL site. Comments largely reiterate or mirror the hypotheses put forward by University of California Berkeley (UCB) Professor Emeritus Garniss Curtis in an article published in the Berkeley Daily Planet in the autumn of 2008[1] and a letter submitted to the Regents of the University of California in spring of 2008.[2] This master response has been developed to address comments from the public regarding the geology of the LBNL site and to correct factual errors and misrepresentations presented in those public comments. For the affected environment and environmental consequences related to geology, please see **subsections 4.2.1, 6.2.1,** and **Section 5.1,Geology and Soils** in the EA.

In his 2008 article, Professor Emeritus Curtis argued that the LBNL site is underlain by two geologic structures of concern: (1) a volcanic caldera containing material with low strength, and (2) west-dipping Cretaceous strata sub-parallel to the slope above Foothill student housing. He alleged that the latter feature could cause the slope to fail during a major earthquake on the Hayward fault and destroy all the buildings from the western margin of the LBNL site to Doe Library on the UC Berkeley campus and beyond, a distance of over 1,000 feet west of Gayley Road.

In January 2010, the organization Save Strawberry Canyon and one of its representatives sent a letter to UC LBNL, posted a video to the web featuring Professor Emeritus Curtis, and published a commentary in the Berkeley Daily Planet[3] reiterating these concerns. The letter and video presented a geologic cross-section of the LBNL site, and the video also presented a geologic map of the LBNL site. These figures portrayed most of the LBNL site as underlain by volcanic rock filling a caldera, portrayed this collapsed caldera deposit (i.e. in-fill) as hundreds of feet thick, and indicated this deposit is in direct contact with Cretaceous strata to the west. The volcanic rock filling the caldera was portrayed as having cavern-sized voids filled with water. Public comments on the CRT Facility Draft EA make repeated reference to these submissions and to Professor Emeritus Curtis' hypotheses of 2008.

Figure 4.0-1 in the EA shows the most recent and comprehensive bedrock geology map of the entire LBNL site, which was prepared by Parsons Engineering Science, Inc. (PES) and UC LBNL. This mapping

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1 Curtis, Garniss H, "Emeritus Professor of Geology Weighs In on Memorial Stadium." Berkeley Daily Planet. 16 October 2008.

2 Curtis, Garniss H. Email to Anne Shaw, University of California Office of the President. 11 May 2008.

3 Wright, Georgia. "Partisan Position: The Volcano Beneath." Berkeley Daily Planet. 28 January 2010.

data was drawn from hundreds of borings[4] as well as from trenches, outcrops, construction excavations, and road cuts (PES and UC LBNL 2000). This map indicates that, contrary to the assertions by some commenters, volcanic rocks do not underlie most of the LBNL site, but rather occur in various isolated to semi-isolated masses. Calculations from this map indicate that 46 acres of the 202-acre site, or 23 percent of the LBNL property, is underlain by volcanic rock, sedimentary rock intercalated with volcanic rock, and sedimentary rock including volcaniclastics (a type of rock that contains volcanic material). The majority of these 43 acres are currently not developed, and the UC LBNL and DOE do not anticipate further development in these areas.

The theory that volcanic rocks at LBNL originated in an alleged caldera collapse alluded to by some commenters is not borne out in the geologic observations of the LBNL site. **Figure 4.0-2** shows a geologic section through the LBNL site from PES and UC LBNL (2000), again based on data from many years of borings, outcrops, road cuts and construction excavations. The thickest volcanic masses at the site, shown on **Figure 4.0-2**, are less than 100 feet thick rather than hundreds of feet thick, as portrayed in the Save Strawberry Canyon video featuring Professor Emeritus Curtis. Further, none of these masses is in contact with Cretaceous strata as portrayed in the video, but rather are underlain by the Tertiary Orinda Formation. Strata in this formation dip moderately to the northeast across all but the very eastern portion of the site indicating structural continuity that does not accord with these strata being blocks within a collapsed caldera.

Volcanic masses at LBNL do not contain the high proportion of tuff (consolidated volcanic ash) indicative of collapse synchronous with eruption that is a defining feature of collapsed calderas. Further, none of the breccias (coarse angular volcanic fragments) observed at LBNL exhibit the welding expected to occur in at least some of them had they been formed in a caldera coincident to eruption. In short, the geometry of the volcanic rock masses does not accord with a caldera collapse origin.

Another part of the caldera hypothesis is the contention that caldera-filling rock masses are weak. For instance in the video by Save Strawberry Canyon, Professor Emeritus Curtis characterizes these materials as “mud with essentially no rigidity,” which describes a fluid. On this basis, some public comments characterize the volcanic rocks at LBNL as having little to no strength and as thus unsuitable to support structures. Setting aside that there is not a scientific consensus that caldera-filling rock masses are particularly weak, and setting aside that the evidence does not indicate there is collapsed caldera deposits at LBNL, the geomorphology developed on the volcanic rocks at and in the vicinity of the LBNL site is not consonant with supposing these rocks are essentially a fluid, or even relatively weaker than the

[4] The boring logs can be found in copies of the geologic reports at the LBNL website http://www.lbl.gov/ Community/ CRT/index.html

surrounding rocks. On the contrary, these rocks underlie promontories, such as that occupied by the Lawrence Hall of Science and the naturally occurring sidehill bench upon which the first cyclotron building was constructed at LBNL. These geomorphic features indicate this material generally has higher strength and erosion resistance than the surrounding materials rather than lower strength, as presumed by some commenters.[5]

Some public comments suggest that there are aquifers and/or perched bodies of subsurface water, particularly in the volcanic rock, that pose a threat to on-site or off-site facilities because they increase the likelihood of slope instability. Hydrogeologic conditions at LBNL have been thoroughly investigated as part of LBNL's Environmental Restoration Program (ERP). These investigations have found that, as is typical throughout the San Francisco Bay Area, groundwater exists at LBNL within pores between sediment particles, such as between the grains of sand in sandstone, and rock fractures that are generally smaller to much smaller than a millimeter across. The investigations have also determined that the volcanic rock at LBNL is among the rock units with the highest permeability at the site, but well within the range of permeabilities for geologic materials in general. In addition, high permeability is not recognized by engineering geologists and geotechnical engineers as correlating significantly with slope instability. For instance, drainage of groundwater relieves the water pressure that contributes to slope instability, and groundwater drains more quickly from higher permeability materials. While groundwater conditions at LBNL can contribute to slope instability, particularly during and after intense precipitation events, no particularly adverse groundwater conditions relative to other hilly locations in the Bay Area have been encountered.

The hydrogeology of LBNL site has been investigated and is well understood, contrary to the implications and assertions made by various commenters. For instance, data on hydraulic conductivity in the Final RCRA Facility Investigation Report by PES and UC LBNL (2000) indicate the Great Valley Sequence bedrock has relatively high hydraulic conductivity compared to the other hydrogeologic units at LBNL, although this conductivity is moderate relative to the range of conductivity for earth materials in general. Module D of PES and UC LBNL (2000) shows that groundwater flow is generally parallel to the slope of the overlying topography at the CRT site and radially away from the Building 70 complex.

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5 This is corroborated by geotechnical tests and descriptions regarding the strength of LBNL volcanic rock samples in three reports covering portions of the volcanic rock close to the CRT site record (Harding Lawson and Associates 1966, 1975, 1983). Bore logs in two of these reports show the standard penetration test equivalent blow counts. This is the number of times a 140-pound hammer must be dropped 30 inches onto a 1.5-inch inside diameter sampler tube to drive it one foot. Most of the standard penetration test-equivalent blow counts were in excess of 50 blows per foot in volcanic rock or the sampler could not be driven a foot due to the rock strength. Bore logs in two of the reports describe the strength of the rock encountered. The strength of the volcanic rocks was typically described as "moderately strong" or stronger, meaning the rock could withstand at least a few heavy hammer blows without breaking.

The report indicates groundwater levels in the vicinity of the CRT site are typically 50 feet below the existing ground surface.

As shown on **Figures 4.0-1** and **4.0-2** taken from PES UC LBNL (2000), the Great Valley Sequence is overlain by the generally low permeability Orinda Formation. The Orinda Formation is in turn overlain in some places by volcanic rock, the other hydrogeologic unit at the lab with relatively high hydraulic conductivity. Consequently, the Great Valley Sequence is hydraulically disconnected from the volcanic rocks at LBNL by the intervening Orinda Formation.

Professor Emeritus Curtis' second contention in the video by Save Strawberry Canyon is that west-dipping Cretaceous strata sub-parallel to the western slope of LBNL would cause this slope to collapse in a Hayward fault earthquake. In the 2008 Berkeley Daily Planet article, he stated such a slide could destroy all the buildings up to Doe Library on the UC Berkeley campus and potentially beyond. This library is over 1,000 feet from the base of this slope.

Studies[6] undertaken by PES and UC LBNL (2000), Fugro (2002), and Kleinfelder (2006) on the western slope of LBNL did not find west-dipping on this slope. Rather, these successive studies found these strata generally dip north between 20 and 50 degrees. The mischaracterization of the attitude of these Cretaceous strata aside, the larger concern raised by public comments regards potential failure of this slope and damage to areas of the campus to the west during a strong-to-major earthquake (magnitude 6 to 8) on the Hayward fault. The generally accepted upper limit uplift rate of 1 millimeter per year in the Bay Area indicates this slope has existed for at least tens of thousands of years, during which it has experienced at least tens of Hayward fault earthquakes based on current understanding of this fault. Bedrock failure of this slope during any of these earthquakes would have deposited material derived from the Cretaceous strata at the toe of the slope, which is occupied by the Hayward fault.

Fault and geotechnical investigations[7] for Foothill student housing in this location did not encounter such landslide deposits. Rather, soil containing rhyolite, a volcanic rock, was encountered west of the Hayward fault. Neither this rock, nor any volcanic rock, exists on the slope above. This rock was likely translated north by the movement of the block east of the fault from the mouth of Strawberry Creek, which does have volcanic rock in its watershed. In addition, an inactive shear zone located generally along Gayley Road to the west (the "Louderback trace") was overlain by only a few feet of natural soil deposits. The last movement on this shear zone was at least 11,000 years ago, indicating that any landslide deposits in this location are at least that old. Consequently, the geologic record indicates the

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6 These studies can be found on the LBNL website http://www.lbnl-cag.org/

7 Harding Lawson Associates, 1986, 1988a, 1988b. These studies can be found on the LBNL website http://www.lbnl-cag.org/

western slope of LBNL is stable with regard to potential bedrock landslides impinging on areas beyond the toe of the slope posited in the public comments. The potential for landslides in the Berkeley Hills exists whether or not the DOE maintains a national laboratory on the LBNL site. The Proposed Action would reduce the potential for landslides by removing the small landslide present on site prior to construction.

Master Response 2 – Site Specific Geologic/Geotechnical Conditions

Some of the public comments on the Draft EA state or suggest that the CRT site is unsafe for the construction of the proposed building. These comments typically make one or more of the following assertions: (1) the CRT site is dangerous because it is located in the Alquist-Priolo Earthquake Fault Zone of the Hayward fault; (2) the CRT site is on a steep slope that is a fault scarp; (3) the CRT site is unstable and prone to landslides; (4) there have not been sufficient field explorations to adequately and accurately assess site conditions. This master response has been developed to address these comments from the public regarding the geology of the CRT site and to correct factual errors and misrepresentations presented in the public comments.

A. Project Location relative to the Hayward Fault Earthquake Fault Zone

The State Alquist-Priolo Act (A-P Act; 1972, California Public Resources Code, Chapter 7.5, Division 2) defines an active fault as one that has ruptured the ground surface within the past approximately 11,000 years (the Holocene Epoch). The main purpose of the A-P Act is to prevent the construction of buildings used for human occupancy on active faults, and to prevent loss of life due to building collapse from surface-fault rupture (Hart and Bryant, 1997; California Division of Mines and Geology [CDMG], 1999). The A-P Act is designed specifically to mitigate "by avoidance" the hazard associated with surface-fault rupture during earthquakes.

The law requires the State Geologist to establish regulatory zones known as Earthquake Fault Zones around the surface trace of active faults and to issue maps depicting these zones. The earthquake fault zones vary in width but are 0.25 mile wide on average. The maps prepared by the State Geologist are distributed to all affected cities, counties, and state agencies for their use in planning and controlling new or renewed construction. Local agencies must regulate most development projects within the zones. Projects include all land divisions and most structures for human occupancy. Before a project can be permitted, cities and counties must require a geologic investigation to demonstrate that proposed buildings will not be constructed across active faults. An evaluation and written report of a specific site must be prepared by a licensed geologist. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back from the fault (generally 50 feet) (California Geological Survey, Department of Conservation website; accessed November 30, 2010).

As stated in the EA and as shown in the site plan presented in Kleinfelder's 2007 geotechnical investigation report, the eastern boundary of the Alquist-Priolo Earthquake Fault Zone of the Hayward fault intersects the CRT site. To comply with the State Alquist-Priolo Act, a site-specific surface-fault rupture study was performed by Kleinfelder in 2006, which demonstrated active faults do not exist on the CRT site. The 2006 surface fault rupture study was peer reviewed by WLA. To address peer review comments provided by WLA, Kleinfelder included assessment of the explorations previously performed, which included all of the mapping and subsurface data collected to date (borings, test pits, trenches and seismic refraction profiles) for the CRT site as well as the findings of previous surface-fault rupture studies performed at adjacent or nearby sites (e.g., Fugro West, Inc., 2002; HLA, 1988; WLA, 2007), and prepared a revised fault investigation report, which is dated May 13, 2009. All of the data including Fugro's seismic refraction and fault trench data and Kleinfelder's independent seismic refraction and fault trenching data did not reveal evidence for the existence of faults at the CRT site. It should also be noted that geologic publications, including the A-P Earthquake Fault Zones maps, do not show a mapped trace anywhere on the CRT site. Based on the geologic information obtained and geologic exploration performed, Kleinfelder, WLA, and Fugro concur that there is no evidence that active faults intersect the planned CRT building site. All of these studies conclude that the active fault trace of the Hayward fault lies hundreds of feet west of the proposed CRT building site, near the base of the slope.

Also, as part of project construction, near-surface colluvial soils and/or landslide deposits at the CRT site will be excavated and removed prior to the construction of the building. At that time, Kleinfelder's Certified Engineering Geologist will observe and document the conditions exposed, and again check for evidence of active faulting. However, the existing site-specific data coupled with the data from nearby A-P studies (see Plate 6, Kleinfelder 2006 Fault Study report) suggest that it is highly unlikely that previously undetected active faulting will be found intersecting the CRT building site.

B. CRT Site Slope

Some comments assert that the steep slope at the project site is a fault scarp associated with the Hayward fault, and is therefore likely to become unstable under seismic conditions or during wet periods.

The slope on which the CRT project would be built is not a fault scarp if the term is taken in the usual sense of connoting a surface coincident with a fault plane. The Hayward fault has been mapped as dipping 80 degrees to the west from horizontal (Graymer et al. 2005). The western slope of LBNL slopes 20 degrees from horizontal (measured from the top of the slope at the western edge of the Building 50/70 area to the base of the slope near Cyclotron Road). Because the angle and direction of the slope's dip is not the same as the angle and direction of the Hayward fault, the slope cannot be a fault scarp associated with the Hayward fault. In addition, the results of geological fault trenching, review of aerial photographs, geologic mapping, and review of published geologic literature indicate the slope is not a fault scarp feature and is underlain in the near-surface by north-dipping, unfaulted bedrock strata. The bedrock structure exposed by explorations on the CRT site is not consistent with that expected from a near-vertical dipping fault plane such as that documented for the Hayward fault.

Another way to ascertain the potential of the existing slope to be a fault scarp is to examine past uplift rates of the tectonic plates on either side of the Hayward fault and compare these rates with the features of the slope at the CRT site. Although academic in nature, this assessment discussed below provides additional evidence that the CRT slope is not a fault scarp feature and provides evidence for the low potential for deep seated landslides at the site. Maximum tectonic uplift rates throughout the Bay Area are thought be less than 1 millimeter (mm)/yr, or 1 meter (m)/thousand years (Ferritti et al. 2004). Assuming the maximum uplift rate of 1 mm/yr, assuming only east side up motion (although as noted above, available data indicates west side up motion currently [Williams 1992]), and discounting erosion of the ridge crest, the 80 m (260 ft) high slope between the Hayward fault and the top of the slope at the Building 50/70 area took at least 80,000 years to develop. The reported recurrence interval for earthquakes on the northern Hayward fault ranges from <270 years to 710 years (Hayward Fault Paleoearthquake Group, 1999), although this is recognized to probably derive from an incomplete paleoseismic record (2007 Working Group on California Earthquake Probabilities, 2008). Even taking the maximum interval of 710 years, the subject slope has experienced more than 100 earthquakes on the immediately adjacent portion of the Hayward fault. The reported recurrence interval for the southern Hayward fault is 170 years ± 82 years for the last 11 events. The interval for the last five events was reported as 138 years ± 58 years (Lienkamper and Williams 2007). Taking the minimum interval of 138 years indicates the subject slope has experienced nearly 600 such earthquakes.

Despite the number of earthquakes occurring during the development and existence of this slope, fault investigations regarding the Hayward fault concluded landslide deposits due to bedrock slope failure are not present at the toe of the slope below the project site (HLA 1988), indicating the slope is stable on a broad scale as it relates to bedrock slope failures.

With respect to concerns regarding slope instability during wet periods, note that the slope has existed for tens of thousands of years, including periods with substantially more precipitation than at present. The minimum time for this slope to develop includes most of the Tahoe and all of the Tenaya and Tioga glacial episodes. Multiple lines of evidence indicate that California has received more precipitation during these cooler periods (e.g., Oster et al. 2009). The slope in the vicinity of the project does not exhibit deep bedrock instability despite experiencing most earthquakes on the nearby Hayward fault during wetter periods. While the available retrospective climate data suggest the site will become drier overall in a warmer world (associated with climate change), should the site become wetter the evidence indicates it will still be stable. Nonetheless, it is unlikely that global warming will have a measurable or noticeable effect in the site vicinity during the lifetime of this project.

With regard to the project site and its immediate vicinity, a seismic slope stability investigation conducted in accordance with CGS SP 117 confirmed that there is a relatively low potential for seismically-induced landslides to occur at the CRT site (Kleinfelder 2010b). While it is true that severe storms do cause and have caused landslides in the Berkeley Hills in the past and will again in the future, development of the CRT facility will increase the stability of this site by removing surficial deposits that are prone to shallow landsliding.

C. Suitability of Project Site for the Proposed CRT Building

Several comments questioned the suitability of the proposed site for the CRT building, and suggest or assert that the proposed building would not be stable given the presence of expansive or landslide materials and potentially adverse bedding conditions on the CRT site.

The site and vicinity is underlain by Cretaceous marine sedimentary strata, composed of interbedded sandstone and shale. These rocks of the Great Valley Sequence constitute bedrock at the site. The use of the term "bedrock" to describe in-place rock of the Great Valley Sequence is entirely consistent with local geologic and engineering precedents and practices. All structures proposed as part of the project will be supported by foundations within this bedrock; no building foundations have been designed to be supported by colluvium, landslide deposits, or expansive soil/bedrock.

Regarding certain comments provided by Dr. Curtis (UC Berkeley Professor), UC LBNL cannot comment on his observations of reported westward dipping beds at angles of 30 to 40 degrees because the precise location of this exposure has not been documented. However, Dr. Curtis' observations would imply that there are adverse bedding or "dip-slip" conditions on the slope at the proposed CRT or other sites at LBNL. The Kleinfelder (2006 and 2007) subsurface explorations using multiple trenches and test pits to assess the underlying soil and bedrock conditions at the CRT site encountered northeast-striking (i.e., roughly parallel to slope gradient) and north to northwest dipping (i.e., roughly perpendicular to slope gradient) bedding, which is not adverse bedding and therefore, would be considered favorable bedding for development at the CRT site. The geologic and geotechnical studies (Kleinfelder, 2006 and 2007) included reconnaissance mapping; review of existing geologic reports, published geologic information, and historic aerial photographs; and trench and test-pit bedrock exposures. These studies did not indicate evidence of deep-seated bedrock landslides in the immediate vicinity of the CRT site.

The subsurface explorations did expose localized, relatively thin, surficial, generally colluvial-derived landslide deposits covering one portion of the site. These deposits will be removed during site grading and will no longer exist or present a slope instability concern.

Regarding the expansion potential of on-site and import fill and bedrock material, test results performed on siltstone bedrock from samples obtained from explorations presented in Kleinfelder's 2007 report indicated that the siltstone bedrock has a low expansion potential. Additionally, only non-expansive imported fill will be allowed on site. The quality of the material to be used for on-site grading/construction is detailed in the project specification. The project geotechnical engineer will observe and test the material to be used to confirm that the project specifications are met.

Regarding construction of foundations, no foundations for the proposed project will be constructed within landslide, colluvial, or expansive deposits. All of the landslide deposits that underlie the building site will be removed during grading for the project. The existing colluvium will be removed and the CRT building will be founded on the underlying bedrock with micropiles extending completely within bedrock to support localized areas near the front of the excavation. Note that these landslide and colluvial soils do not extend below the proposed depth of excavation. The remaining portions (outside the building footprint) will be stabilized through engineering measures. The cut for the building will also be stabilized using standard engineering measures. The proposed adjacent cooling towers and adjacent retaining wall will be constructed on drilled piers that gain support from the underlying bedrock (i.e., the piers extend into the bedrock). In addition, the foundation of the cooling towers will not be connected with the CRT building foundation.

One comment expressed concern that the proposed design of the HPC floor with few interior columns could make the building susceptible to collapse (pancaking) during a major earthquake. Because the proposed structure will be designed in strict accordance with the current seismic design provisions of the California Building Code, the interior columns should not fail and therefore the potential for "pancaking" is highly unlikely. The future CRT building would be designed by a qualified structural engineer experienced in seismic design to resist and accommodate the strong ground shaking associated with the Maximum Credible Earthquake for the site.

In summary, the vast amount of geologic data collected has shown that this site does not possess hazards, such as active fault traces, landslide deposits, adverse bedding conditions, expansive bedrock, or a high potential for slope instability under static or seismic conditions (after grading), that would preclude construction of the proposed building. With sound, site-specific structural, civil, and structural engineering design (as required by the 2007 California Building Code), similar to those used throughout the Bay Area and in accordance with current building codes, the proposed facility can be safely constructed for its intended purpose. Additional explorations, including borings, would serve to refine the design criteria, and would not negate the viability of the proposed project. All data clearly demonstrate that the site is suitable for the proposed construction.

D. Data Used in the Investigation of the CRT Site

Some comments focus on the data reported in or used in the Kleinfelder reports for the CRT project and some questioned the adequacy or accuracy of the data and reports prepared for the project. Comments also concern the relocation of the CRT site within the existing slope and the "usefulness" of the data obtained for the previous CRT location.

As described above, an extensive amount of site specific and vicinity data were used to confirm that no active faults are present on the CRT building site and to characterize the site conditions so as to develop recommendations for the building design and construction. Although the geologic and geotechnical investigations were performed for a building footprint that has since moved approximately 50 feet northward, the information presented in the existing geologic and geotechnical reports is sufficient for the design of the proposed structures. There will be additional exploration performed at the site prior to construction, but these explorations are to refine the design and will not result in negating the potential use of the site for the proposed structure. During construction, a certified engineering geologist and/or geotechnical engineer will be on site full-time during site grading and foundation installations to further assess the subsurface conditions and check for fault traces, landslide deposits, and bedrock quality.

Some comments are related to the subsurface information shown on the borings and site plans in Kleinfelder's reports. Comments include questions regarding past exploration shown in Kleinfelder's 2007 geotechnical report that was performed by GeoResources, Kleinfelder, and Fugro. The GeoResource borings were considered in Kleinfelder's evaluation and are shown on the map and are not "useless," as one commenter stated. Another concern was the omission of Kleinfelder's 2006 Blackberry Gate boring logs from Kleinfelder's 2007 geotechnical report. Although not included in the report, these boring logs were considered in the 2007 report and were also considered in Kleinfelder's 2009 evaluation. Those logs can be found in the Blackberry Gate report (Kleinfelder, 2006). With the exception of borings drilled within a previous fill repair, these Blackberry Gate borings encountered bedrock at shallow depths. And finally, trench logs of the three Fugro trenches (T-1 to T-3) were not included in the Kleinfelder 2007 fault hazard investigation report for the CRT but the data from those trenches, as well as all the other pertinent geologic and geotechnical findings, were considered in the assessment and analysis of the site geologic and geotechnical conditions, and were used to develop Kleinfelder's (2007 and 2009) conclusions and recommendations for the proposed project.

A concern was raised that the information presented in the various borings in and around the site varied. However, variations in the subsurface conditions encountered in the borings drilled at the site are to be expected due to their locations along the hillside and within areas of varying past grading activities at the site. Most borings are tens, if not hundreds of feet apart. The lithologic differences between the various Fugro and Kleinfelder borings presented above are consistent with the site conditions and what would be expected based on natural and man-made (i.e., fill) conditions at the specific boring locations. For example, the Fugro and Kleinfelder borings are hundreds of feet apart from each other. The Fugro (2002) borings B-1 and B-2 encountered clay fill to depths of 5 to 6 feet overlying 4 to 10 feet of clay deposits, which represent other fill or colluvial deposits north of the site near Building 50D and adjacent to Cyclotron Road. Boring K-3 encountered bedrock near the surface because K-3 was located in a previously cut area near Buildings 70 and 70A. Kleinfelder boring K-1 near the southeastern footprint of the CRT encountered 7 feet of clay fill at the western edge of the constructed fill pad for Building 70A and directly overlies bedrock.

A concern was raised regarding the existing information used for Kleinfelder's fault study. Plate 6 that is referred to at the end of the Kleinfelder (2006) fault investigation report shows the general outline of previously performed fault studies in the vicinity of the proposed CRT project site. The original comment requested that specific California Geological Survey (CGS) studies at the site or referenced "probes" be included in Kleinfelder's report. However, based on Kleinfelder's review of available information from CGS, no probes or borings were performed by CGS at the site.

Master Response 3 – Decision to Prepare an Environmental Assessment

Numerous comments on the CRT Facility Draft EA state that the EA analysis is not adequate and request that the DOE prepare an Environmental Impact Statement (EIS) to evaluate the Proposed Action.

An EIS was not initially prepared because the Proposed Action is not among the classes of actions listed in Appendix D to Subpart D of the DOE NEPA Implementing Procedures (10 CFR Part 1021) that typically require preparation of an EIS. In accordance with CEQ and the DOE regulations, the DOE prepares an EA in order to assist agency planning and decision making, including a decision on whether to prepare an EIS. If, based on the Final EA, the DOE determines that there are no significant impacts, a Finding Of No Significant Impact would be issued, and an EIS would not be required.

Following CEQ and DOE NEPA implementing procedures, DOE prepared this Environmental Assessment to assist the Agency in determining whether to prepare an EIS. This EA is complete, appropriately detailed, and has followed all of the applicable requirements of NEPA and the DOE's NEPA Implementing Procedures.

Master Response 4– Gas Main Risk at CRT Site

Many public comments were received expressing concern about the location of gas distribution pipelines at the LBNL site. In light of the recent gas transmission pipeline explosion in the City of San Bruno, commenters were concerned that a similar event could occur at the CRT building if the pipelines are aging, or if pipeline leaks are not repaired in a timely manner, or if pipelines are located adjacent to other utility lines such as water and sewer lines. Commenters requested additional information about the relocation of utilities as part of construction of the proposed CRT facility.

Information about utility relocation that would take place as part of the proposed project has been added to the EA in **subsection 3.1.6, Utilities and Infrastructure**. A 6-inch medium pressure gas main runs between Cyclotron Road and Buildings 50 and 70 and provides gas service to the LBNL site; no other natural gas pipelines or mains serve LBNL. As this gas main passes through the CRT site, the Proposed Action would relocate the gas main approximately 400 feet to the north of its current alignment to allow for the construction of the proposed building. Utility lines are routinely relocated in conjunction with construction projects.

This gas main is not similar to the 30-inch transmission pipeline with a pressure of 386 pounds per square inch gauge (PSIG) that was involved in the recent San Bruno accident. Instead, the gas main has a 6-inch diameter and a pressure of 13.5 PSIG. There are automatic shut-off valves at every building on the LBNL site and at the point of connection of this gas main to the PG&E line at the northeast of Foothill parking lot. The gas main at the LBNL site was installed in the 1960s and upgraded in the 1980s. A subcontractor performs a leak survey on the gas main every year and any leaks that are detected are repaired immediately. The most recent leak survey conducted in December 2009 indicated that the main is in good condition other than a few non-hazardous leaks that were repaired (Manesco Corporation 2009). The potential for distribution line leaks and ruptures is greatly reduced by the routine leak surveys and the automatic shutoff valves. The relocated gas main will not be in the same trench as water, electricity or sewer lines. Safety would improve with the installation of the new gas main because it would be constructed to meet current codes.

The gas main crosses the Hayward fault near the Foothill parking lot where automatic shut off valves are present that would shut off supply in the event of a rupture. The Proposed Action would not make any changes to the gas main in the area around the Hayward fault. The Proposed Action would therefore not increase the risk of explosion of the gas main compared to current conditions. The fact that the modifications to the gas line would meet current code requirements, that the gas line is only a medium pressure line, and that there are automatic shutoff valves would ensure that a gas pipeline explosion would not be a reasonable scenario.

Master Response 5 – Purpose and Need of the Proposed Action and Alternatives

Several comments on the CRT Facility Draft EA request evaluation of alternative sites and comparison to the Proposed Action site. Comments were also received with respect to the need to place the CRT facility at the Proposed Action site.

The EA evaluates the environmental effects associated with developing the CRT facility at three off-site alternative locations as well as another location on the LBNL site, and the No Action alternative as described in **Section 3.2, Alternatives to the Proposed Action**. These alternatives were carried forth for detailed evaluation because they would meet the project purpose of consolidation of the dispersed programs at a location on the LBNL site (see further discussion of the purpose and need of the Proposed Action, below). Consistent with CEQ regulations (40 CFR 1502.14), each alternative was evaluated in detail so that readers may evaluate the comparative environmental impacts. **Table 1.0-1, Summary Table of Actions and Impacts**, provides a summary comparison of environmental effects associated with each alternative. The EA also considered and eliminated other on-site and off-site alternatives, as described in **Section 3.3, Alternatives Considered but Eliminated**. These alternatives were eliminated because they would not meet the purpose and need of the Proposed Action or were determined to be otherwise unreasonable. In addition, two other building sites on the LBNL site were considered during CEQA review, but were found to be unreasonable.

The purpose of and the need for the Proposed Action are described in **Section 2.0, Purpose and Need,** of the EA. As stated there, while the NERSC computers and staff are located in Oakland, the CRD staff is located on the LBNL site, and CSE researchers are located on the UC Berkeley campus, dispersed in multiple buildings in individual and group workspaces that are inadequate in both size and functionality. This limits the opportunities for frequent interaction and collaboration and future growth. These obstacles to collaboration and growth are anticipated to continue in the future.

As a result of the aforementioned challenges, there is an immediate and long-term need to increase computer floor space, to improve workspace size and functionality for both individual and group efforts, and to co-locate CRD staff and some CSE researchers adjacent or nearby to the NERSC. A facility or facilities that bring people and systems together in space designed for functionality and collaboration would result in improved efficiency and productivity, as well as foster intellectual exchanges. Such a facility or facilities should also provide:

- Integrated and appropriately designed space that houses and enables the continued operation and future advancement of LBNL's NERSC HPC national user facility, CRD, and joint LBNL/UC Berkeley CSE programs;
- Adequate space, chilling capacity, and infrastructure to accommodate next-generation computing equipment and to allow for continual future upgrades to such equipment;
- Access to a large, reliable, and economical electrical power source. The power source should be capable of serving both the immediate and potential future needs of LBNL's computing program;
- Ability to connect the facility to modern fiber optics that can economically be connected to the existing high-speed DOE ESnet Bay Area Metropolitan Area Network;
- Convenient access to other LBNL scientific facilities, programs, researchers, and services; a location that fosters interaction and collaboration between the NERSC staff and others, including UC Berkeley researchers.

For the reasons above, the DOE proposes to relocate and consolidate ASCR-funded LBNL programs with other LBNL/UC Berkeley programs focusing on computational and computer science research in a new facility on the LBNL site. The Proposed Action includes the relocation of the NERSC HPC national user facility, the relocation and consolidation of all NERSC and CRD staff, and the creation of a collaborative space for the joint UC Berkeley/LBNL CSE program. Housing these activities in the same new building as the supercomputing systems would centralize and co-locate all similar and related functions and programs to improve efficiency and productivity and foster intellectual exchanges and collaboration. The location for the new building to house these relocated programs and computational systems should be in close proximity to the UC Berkeley campus to enable extensive collaboration of CSE staff with NERSC and CRD staff.

Master Response 6 – Visual Quality of the Proposed Action Site

Several comments indicate that the Proposed Action site represents a portion of a natural landscape that is a visual resource in the area that would be lost if the CRT building were constructed. This EA discusses the affected environment and environmental effects related to visual quality in **subsections 4.2.6** and **6.2.6,** and **Section 5.6, Visual Resources.**

As depicted in EA **Figure 3.0-2, Approximate Proposed Action Site**, the site is surrounded by development. It has been altered and disturbed over several decades of use by LBNL and likely by agricultural uses preceding that. The site is relatively narrow, horn-shaped, and tapers into the nexus of two roadways that converge at its northernmost point. It is bounded by the LBNL site's busiest roadway (Cyclotron Road) along its entire western edge, and to the east by the road that services the Building 50 and Building 70 complexes. It is transected by the Seaborg stairway and an underground utility corridor (which includes its above-ground appurtenances), and it bears visual evidence of the topographical modifications caused by past grading activities. The site hosts many visible tree stumps from the past removal of eucalyptus trees.

As described in the EA, the predominant natural vegetation on the site consists of approximately 75 (non-native) eucalyptus trees and a few (native) hardwoods, as well as a sparse understory of non-native grasses. The Building 50 complex – which features several of the Lab's tallest buildings, and the Building 70 complex, are perched above and overshadow the upper ridge of the site and roadway along its eastern edge. Immediately below the site, along the western edge, a bustle of activity occurs along Cyclotron Road, which features virtually all of LBNL's vehicle, bus, and truck traffic, a guard check point, and a turn-out to the Building 88 accelerator complex below.

The site is not publicly accessible as it is within the LBNL site fenceline. It is also not visible from off-site locations, with the exception of the uppermost portions of some of the site's tallest eucalyptus trees, which are visible from limited areas nearby. A grove of visual screening trees lines the western side of Cyclotron Road, directly downslope of the project site. The screening trees would not be affected by the Proposed Action and would continue to provide visual buffering and screening of the site from City of Berkeley vantage points below. Intervening topography and trees would obstruct views of the building from locations in Strawberry Canyon to the southeast of the project. It is also over the hill from the Strawberry creek drainage basin. The project site does not include the riparian area associated with the Cafeteria Creek, which is east and south of the project site and outside the area of disturbance. Implementation of LBNL SPFs VIS-4a and VIS-4b, which are included in the Proposed Action, would reduce effects related to light and glare. Furthermore, cumulative effects related to visual resources were considered in **subsection 6.2.6.** As discussed there, any potential visual impact related to the Proposed Action would not be cumulative with the impacts from other projects because the other projects proposed at LBNL, UC Berkeley and the City of Berkeley would not form part of the scenic views that contain the project site.

Master Response 7 – Risk of Wildland Fire at the CRT Site

Several commenters expressed concerns about the risks of wildland fires at the LBNL site in general and at the proposed CRT site in particular.

The risks associated with wildland fires at the Proposed Action site are evaluated in **Section 5.3, Hazards, Human Health, and Accidents**, of the EA. Firefighting services at the Proposed Action site are described in **subsection 4.2.12** and **Section 5.12, Public Services**. As stated in the EA, the fire station on the LBNL site is within 1,500 feet of the project site and would be adequately staffed to serve the project.

The LBNL site is situated in the lower East Bay hills and is thus in an urban/wildland interface area where wildland fires are a concern. However, due to intensive, proactive efforts undertaken by the UC LBNL, the site stands as a bulwark against wildland fire risk both to its own population and assets as well as to those of its surrounding neighbors.

After careful planning and analysis of fuel loads and potential fire patterns following the East Bay Hills fire of 1991, the 200-acre LBNL site has undergone a major vegetation management program to transform the site into a natural fire break. Hundreds of Eucalyptus trees and flammable understory were removed or scaled back. Annual vegetation management is ongoing to this day and includes limbing up and removal of problematic (such as sick or dying) trees, and the mowing and removal of brush and grasses by hand gardening and goats. Vegetation management is carefully undertaken to ensure that flame heights and temperatures would not be sufficient to consume buildings and large trees throughout the site, nor to create fire bands that spread fire across the site and to adjacent properties.

The LBNL site includes a fully staffed (24-hour) Alameda County fire station with engines, equipment, and firefighters trained in fighting wildland fires. In fact, this LBNL-funded fire station provides primary fire protection services to many surrounding neighborhoods in Berkeley and Oakland.

The site includes three 200,000-gallon water tanks to maintain constant pressure and ample supplies of fire-suppressive water in the event of fire and/or earthquake. While East Bay Municipal Utility District water lines servicing LBNL and its neighbors may be damaged during an earthquake, LBNL will be able to access this gravity-pressurized water to fight resulting fires in the surrounding East Bay hills and to resupply pumper trucks.

LBNL gas lines include automated shut-off valves that would be activated if lines were severed during an earthquake or similar event. LBNL's newer buildings, including the proposed CRT building, are constructed to the latest fire codes (e.g., have sprinklers) and therefore would be safer than older buildings, including most of those in surrounding neighborhoods and properties. Given these safeguards, which are required by the California Building Code or are standard practices by UC LBNL, the risks from fires would be minor.

Response to Comment Matrix

Response to Comments Matrix

Comment #	Commenter	Comment Summary	Response
1	Bay Area Air Quality Management District	The commenter states that the Draft EA's determination of no significant effects was not based on the BAAQMD thresholds because the project analysis began before the new thresholds were adopted by the Air District.	Environmental impacts from greenhouse gas emissions associated with the Proposed Action and alternatives are discussed and evaluated in **subsections 4.2.8** and **5.8, Greenhouse Gases,** in the EA. In May 2010, BAAQMD proposed Draft CEQA Guidelines that include thresholds of significance for GHG emissions. The draft guidelines were adopted on June 2, 2010. The new thresholds do not apply to this project, however, as BAAQMD directed lead agencies to apply the new thresholds to only those projects for which a Notice of Preparation is published and for which environmental analysis commences on or after June 2, 2010 (See Bay Area Air Quality Management District, Resolution No. 2010-06). The environmental review for the CRT project under CEQA began in 2007 and was completed in 2008, and the NEPA review was commenced in October 2009. As such, based on the applicable federal threshold, the impact from the project's projected GHG emissions is not considered substantial.

Comment #	Commenter	Comment Summary	Response
2	Bay Area Air Quality Management District	The commenter states that the Air District urges the DOE to commit to additional measures to reduce the project's GHG emissions, including adding on-site renewable energy sources; meeting LEED platinum building standards; and employing the most energy-efficient computer servers.	The project has been designed to the highest energy efficiency standards prevailing at this time. The project is committed to purchasing Renewable Energy Credits (RECs) equivalent to at least 7.5% of its total on and off site electric power usage. The proposed project incorporates numerous design features that are consistent with AB 32 goals and strategies and with reduction measures in the BAAQMD guidelines. These features would reduce the proposed project's GHG emissions by substantially more than 29 percent compared to business as usual (BAU). These measures are the following: (1) The project has been designed to meet LEED Gold standards, which means among other things that the project's energy consumption would be more than 30 percent better than the state's energy efficiency standards for residential and nonresidential buildings established under Title 24, Part 6 of the California Code of Regulations. The project includes numerous measures to minimize energy use, including a cool roof, natural ventilation, daylighting, use of high performance computer exhaust heat to warm up the office space, etc. (2) The project would be supplied electricity through the Northern California DOE Laboratory Electric Power Purchasing Consortium, which means that at a minimum 20 percent of the power consumed by the project would come from renewable sources. With respect to the rest of the power used, it is anticipated that as a result of the Renewable Portfolio Standards,[1] 33 percent of the energy supplied by investor owned utilities within California by 2020 will be from renewable sources which would further reduce the indirect power generation emissions that would be associated with the project. (3) The project includes limited parking only for disabled employees and visitors (in order to avoid generation of new trips) and includes bike facilities, showers, transit service, and a transportation demand management (TDM) program that would reduce the project's vehicular emissions by more than 40 percent compared to BAU. (4) The project includes rainwater harvesting to minimize water use (and water supply and distribution related GHG emissions). (5) The project includes roof and non-roof paving materials that are designed to reduce the facility's heat island effect. (6) The project includes waste reduction measures, including use of recycled materials. Because all feasible GHG reduction measures have been incorporated into the proposed project and because these collectively would reduce the project's GHG emissions by substantially more than 29 percent compared to BAU, the proposed project would not set back the state in its AB 32 related efforts.

[1] California's Renewable Portfolio Standard program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources. Investor-owned utilities were required to source 20 percent of their energy from renewable sources by 2010. This will increase to 33 percent by 2020, in accordance with Executive Order # S-14-08, which directs the California Public Utilities Commission to develop regulations to meet this goal.

Comment #	Commenter	Comment Summary	Response
2 (cont.)			Note that due to the high-energy use associated with the proposed project, a detailed evaluation of the project's energy use and opportunities to minimize the use was conducted by UC LBNL in July 2010. The study examined the two components of the project separately - the high performance computer (HPC) component and the office component and compared the proposed project design against benchmarked data to determine how the project compares to other similar (although not directly comparable) facilities. The HPC component, due to its energy use associated with supercomputers, was compared to data centers using two metrics - Power Usage Effectiveness (PUE) and Data Center Infrastructure Efficiency (DCiE; DCiE is the reciprocal of PUE). The study showed that the CRT HPC has been designed with a PUE of 1.081 and a DCiE of 0.925, which is better than any data center benchmarked to date. Note that a DCiE of 0.5 is considered typical practice for a data center and a DCiE of 0.7 and above is better practice. With respect to the office component of the project, the annual energy consumption was compared to the appropriate baseline building consumption defined by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)/Illuminating Engineering Society of North America (IESNA) Standard 90.1-2007 for a comparable office building. The office component as designed would achieve 47 percent energy savings when compared to the baseline-building model. The CRT project site is not conducive for the development of on-site alternate energy sources such as wind and solar. However, as part of its sustainability plan, LBNL is exploring the potential to develop these resources elsewhere on the LBNL site. LBNL is also considering the following renewable energy projects. 1. LBNL Site 1 MW Photovoltaic (PV) 2. LBNL site wide renewables 3. Tri-Lab Collaboration - Large scale wind and PV project at Lawrence Livermore National Laboratory Since the bulk of the CRT's projected GHG emissions are associated with its energy consumption, additional design elements that would advance the project to a LEED platinum would still not help reduce these off-site GHG emissions associated with power generation.

Comment #	Commenter	Comment Summary	Response
2 (cont.)			NERSC has made energy efficiency a priority in its computer system procurements and evaluations. The latest NERSC supercomputer uses liquid cooling technology and the competitively selected system provided the best scientific application performance per megawatt. Older, less energy efficient, systems are considered for cost-effective replacement. Due to high-energy costs, NERSC always includes energy efficiency as one of the selection criteria when considering new supercomputers. However, as these supercomputers are needed for advanced research and as part of the DOE's mission, the final selection cannot be based solely on energy efficiency considerations. Server consolidation and virtualization (a way to make such machines more efficient) save energy by replacing mostly idle computers with a smaller number of less idle systems. NERSC supercomputers solve extremely large and complex scientific problems and, unlike commercial servers, have less than 10% average idle time. NERSC will continue to explore other approaches that would further improve computer energy efficiency.
3	East Bay Municipal Utility District	The commenter states that its comments on the NOP for the EA still apply.	Response to NOP comments are presented in **Response to Comments 4** and **5** below.
4	East Bay Municipal Utility District	The commenter state that EBMUD's comments were incorporated in the Final EIR under CEQA and should be incorporated in the EA. The comments on the EIR are related to water service, water recycling and conservation.	Consistent with the analysis in the Final EIR, the EA states in **subsection 5.11** that "the proposed facility would include high-efficiency fixtures and storm water reclamation for toilet flushing and recirculation of cooling water, which would reduce water demand." As stated in the Final EIR, UC LBNL has and would continue to coordinate with EBMUD to incorporate water-efficient practices and consider a recycled water system for the Lab.

Comment #	Commenter	Comment Summary	Response
5	East Bay Municipal Utility District	The commenter indicated that wet weather flows are a concern for EBMUD. The Regional Water Quality Control Board (RWQCB) issued an order prohibiting further discharges from EBMUD's Wet Weather Facilities and a subsequent stipulated order for preliminary relief that requires EBMUD to begin work to reduce inflow/infiltration and lay the groundwork for future efforts to eliminate discharges from Wet Weather Facilities. EBMUD would like consideration in the EA regarding wet weather discharges and how LBNL proposes to reduce impacts.	The comments concern the issue of infiltration and inflow (I/I) of storm water into the sanitary sewer system. UC LBNL will ensure any new wastewater collection systems for the project are constructed to prevent inflow/infiltration to the maximum extent feasible. Because this effort would involve the installation of new subsurface water supply and wastewater infrastructure, the proposed project would not cause any increase in I/I. Furthermore, UC LBNL has made substantial progress in the past 20 years in addressing sitewide I/I issues as well as reducing overall sanitary sewer flows. As of 2006, a concerted sewer infrastructure upgrade program has reduced LBNL's wet weather I/I rate to approximately 10-percent of that found in the EBMUD service district on average. At the same time, sitewide plumbing upgrades and water-saving systems have reduced LBNL's average sewer flows by over half. UC LBNL is working to further address the I/I on the Lab site. On September 30, 2009, UC LBNL issued a Sanitary Sewer System Management Plan (SSSMP), which guides the Facilities Division and the Environmental Health and Safety Division of UC LBNL in identifying, prioritizing, and continuously renewing and replacing sewer system facilities so as to maintain reliable service, and in cost-effectively minimizing infiltration and inflow. As described in the SSSMP, UC LBNL has established procedures for monitoring and evaluating infiltration and inflow (I/I), including guidelines for taking action to limit I/I. Groundwater infiltration and inflow (GWI/I) and rain-dependent infiltration and inflow (RDI/I) are quantified and monitored to ensure that the hydraulic capacity of the sanitary sewer collection system is not exceeded and to determine if I/I reduction projects should be initiated. UC LBNL also maintains design and construction standards, specifications, and details that ensure that new and rehabilitated sanitary sewer collection system infrastructure is designed and installed in compliance with the latest federal and state regulations, and is in line with general industry standards. The SSSMP contains a framework for implementing the recommendations made by EBMUD in view of the January 14, 2009 RWQCB order. When EBMUD has determined new flow allocation requirements and the schedule for implementation, the SSSMP will allow UC LBNL to react as necessary.
6	Building and Construction Trades Council of Alameda, AFL-CIO	The commenter states their support for the project.	Comment noted.
7	Committee to Minimize Toxic Waste - Sihvola	The commenter refers to controversy with respect to the site of the Proposed Action.	Comment noted. The proposed CRT project site does not include the upper Cafeteria Creek area once proposed for a parking lot, as cited by the commenter. As this area would not be affected by the Proposed Action, any discussion of impacts to this area is beyond the scope of this EA.

Comment #	Commenter	Comment Summary	Response
8	Committee to Minimize Toxic Waste - Sihvola	The commenter suggests that previously a more southern portion of the project site was considered for a building because of concerns related to landslides at the currently proposed site	See **Master Response 2– Site-Specific Geotechnical/Geologic Considerations,** which demonstrates that the CRT site is a geologically safe and suitable site for the proposed building, and that project construction would not trigger a landslide.
9	Committee to Minimize Toxic Waste - Sihvola	The commenter states that the site is located between the Hayward Fault and the edge of a collapsed caldera.	See **Master Response 1–Geological Conditions Underlying the LBNL Site**, which demonstrates that there is no collapsed caldera beneath the LBNL site. See **Master Response 2– Site-Specific Geotechnical/Geologic Considerations,** which discusses the stability of the project site. The project location with respect to the Hayward fault and the site's stability are also discussed in **subsection 4.2.1, Geology and Soils**, in the EA.
10	Committee to Minimize Toxic Waste - Sihvola	The commenter asserts that the caldera is filled with a mixture of mud, perched water, and boulders and that LBNL has not done a comprehensive hydrogeological study of its composition, nor provided hydrostratigraphic units. Comment asserts these would show hydraulic connection between various permeable layers of the sediment.	See **Master Response 1 –Geological Conditions Underlying the LBNL Site.** The site geology at the Proposed Action site is discussed in **Master Response 2– Site-Specific Geotechnical/Geologic Considerations** and **subsection 4.2.1, Geology and Soils,** in the EA. Master Response 1 provides a summary of existing geologic subsurface data. These data do not support the existence of a collapsed caldera filled with a mixture of mud and water. If such a weak structure did exist, the geomorphic expression of the area would most likely be a depression, rather than the prominent ridge that exists. Again, the CRT site is underlain by stable bedrock and is not underlain by volcanic rocks or a hypothetical collapsed caldera structure.
11	Committee to Minimize Toxic Waste - Sihvola	The commenter refers to a letter from Garniss H. Curtis that describes the potential for a catastrophic landslide at the project site following a major earthquake on the Hayward fault. The landslide is postulated to be a consequence of the project site being located on the side of a collapsed caldera.	See **Master Response 1–Geological Conditions Underlying the LBNL Site.** The project location with respect to the Hayward fault and the site's stability are also discussed in **Master Response 2– Site-Specific Geotechnical/Geologic Considerations** and **subsection 4.2.1, Geology and Soils**, in the EA.

Comment #	Commenter	Comment Summary	Response
12	Committee to Minimize Toxic Waste - Sihvola	The commenter refers to hazards and controversy of the Proposed Action site and asks if all of the private industry and public (State of California, UC, Department of Energy, etc.) financiers been adequately informed of what the comment characterizes as CRT's most unsuitable and dangerous location.	The hazards associated with the Proposed Action site are evaluated in **subsection 5.3, Hazards, Human Health, and Accidents** of the EA. Geological hazards are evaluated in **subsection 5.1, Geology and Soils.** Please also see **Master Responses 1 and 2**, which further demonstrate that the CRT site is a geologically safe and suitable site for the proposed building. Also, see **Master Response 7** regarding risk from wildland fires at the CRT site. NEPA and CEQA provide the appropriate mechanisms for informing federal and state decision makers of all environmental issues concerning a project. The DOE has been informed of the environmental issues associated with the proposed CRT location and alternative locations through the EA and the NEPA process, and The University of California Board of the Regents has been informed of the environmental impacts associated with the CRT project through the EIR and the CEQA process.
13	Committee to Minimize Toxic Waste - Sihvola	The commenter requests a list of entities financing the project.	The DOE would fund the relocation of its programs into the proposed facility. Construction of the facility would be funded by the University of California.
14	Committee to Minimize Toxic Waste - Sihvola	The commenter refers to history of landslides at the LBNL site and asserts that building construction has caused landslides at LBNL.	The geologic conditions at the project site are discussed in **subsection 4.2.1, Geology and Soils,** in the EA. See also **Master Response 2– Site-Specific Geotechnical/Geologic Considerations,** which demonstrates that the CRT site is a geologically safe and suitable site for the proposed building, and that project construction would not trigger a landslide
15	Committee to Minimize Toxic Waste - Sihvola	The commenter states that the document has not adequately described, analyzed, and considered all of the natural and man-made hazards present at the site and vicinity.	The hazards present at the LBNL site are described in **subsection 4.2.3, Hazards, Human Health, and Accidents** and the hazards associated with the Proposed Action site are evaluated in **subsection 5.3, Hazards, Human Health, and Accidents** of the EA. Geological hazards at the LBNL site are described in **subsection 4.2.1, Geology and Soils** and evaluated for the Proposed Action in **subsection 5.1, Geology and Soils.**
16	Committee to Minimize Toxic Waste - Sihvola	The commenter states that DOE failed to disclose the significant information related to a collapsed caldera.	See **Master Response 1–Geological Conditions Underlying the LBNL Site**. Also, the EA discloses geological hazards associated with the proposed project in **subsection 5.1, Geology and Soils.**
17	Committee to Minimize Toxic Waste - Sihvola	The commenter states that the proposed project does not assure safe, healthful surroundings because it is located next to the Hayward fault.	The EA evaluates geologic hazards associated with the proposed project, including its vicinity to the Hayward fault, in **subsection 5.1, Geology and Soils.** Also, see **Master Response 2 – Site-Specific Geotechnical/Geologic Considerations.**
18	Committee to Minimize Toxic Waste - Sihvola	The commenter states that the engineering of structures is insufficient to address the instability of the site.	All life-safety risks were assessed in the EA in **subsection 5.3, Hazards, Human Health, and Accidents,** and also described in **Master Response 7, Risk of Wildland Fire at the CRT Site,** and **Master Response 2 – Site-Specific Geotechnical/Geologic Considerations.**

Comment #	Commenter	Comment Summary	Response
19	Committee to Minimize Toxic Waste - Sihvola	The commenter states that the EA does not adequately address concerns related to soil and groundwater, that analysis of various cross-sections of the LBNL site is not possible without mapping of the sites hydrostratigraphic units, and that without this mapping, it is not possible to understand the movement of groundwater inside the caldera and how it could affect the CRT site.	The EA addresses environmental effects associated with soil and groundwater in **subsection 5.1, Geology and Soils,** and **subsection 5.2, Water Resources**. Also, see **Master Response 1–Geological Conditions Underlying the LBNL Site**. As discussed in **Master Response 1**, the hydrogeology of the LBNL site, including the CRT site, has been thoroughly investigated as part of LBNL's environmental restoration program. The hydrologic character of the site has been assessed and the vast amount of subsurface and surface geologic data does not support the existence of a large collapsed caldera structure, and certainly not one in the vicinity of or with any hydraulic conductivity to the CRT site. Therefore, movement of water within the hypothetical caldera during an earthquake is irrelevant.
20	Committee to Minimize Toxic Waste - Sihvola	The commenter states that an EIS should be prepared to address CMTW's concerns.	See **Master Response 3 – Decision to Prepare an Environmental Assessment.**
21	Committee to Minimize Toxic Waste - Sihvola	The commenter states that the EA did not include an adequate analysis of hazards from wildfires.	The EA discusses fire hazards at the LBNL site in **subsection 4.2.3, Hazards, Human Health and Accidents,** and evaluates wildland fire hazards in **subsection 5.3, Hazards, Human Health, and Accidents.** Also, see **Master Response 7** regarding risk from wildland fires at the CRT site.
22	Committee to Minimize Toxic Waste - Sihvola	The commenter is concerned with Seismic Phase 2 project and its approval by the DOE. The commenter has submitted the same set of comments that were previously submitted on the Seismic Phase 2 Project EA as comments on the current EA.	The comments submitted by CMTW on the Seismic Phase 2 project EA, which DOE carefully considered during the review of that project, are pertinent to that project and not the CRT project. To the extent that the Seismic Phase 2 EA comments relate to LBNL site-wide issues such as geologic hazards from proximity to the Hayward fault, or geologic instability due to a hypothetical caldera at the LBNL site, or the issue of wildland fire risks, those issues are addressed in **Master Responses 1, 2,** and **7** in this EA.
23	Committee to Minimize Toxic Waste - Sihvola	The commenter states that the Draft EA does not describe the gas main that would be relocated by the project. In light of the recent gas main related explosion in San Bruno, the commenter is concerned about potential explosion-related risk from the gas main.	Emergency response at the LBNL site is discussed in **subsection 5.3, Hazards, Human Health and Accidents**. See **Master Response 4- Gas Main Risk at CRT Site.**
24	Committee to Minimize Toxic Waste - Sihvola	The commenter states that an EIS should be prepared.	See **Master Response 3 – Decision to Prepare an Environmental Assessment.**

Comment #	Commenter	Comment Summary	Response
25	Committee to Minimize Toxic Waste - Sihvola	The commenter asks: 1. Does the natural gas pipeline serving the CRT site/area cross the Hayward Fault? If so, where? 2. Are there other natural gas pipelines serving the LBNL site that cross the Hayward Fault? If so, where? 3. When were these pipelines installed? 4. When were these pipelines last inspected and/or repaired or replaced? 5. What was the condition of the pipelines when last inspected or serviced? 6. Do they all have automatic shut-off valves? If so, where? 7. Do the gas lines crossing the Hayward Fault have automatic shut-off valves on both sides of the fault? 8. What are the pressures inside the gas pipelines? 9. An analysis of a worst-case scenario, following a natural gas pipeline explosion at the Hayward Fault, serving the CRT site, should be included in the EIS.	Emergency response at the LBNL site is discussed in **subsection 5.3, Hazards, Human Health and Accidents**. See **Master Response 4- Gas Main Risk at CRT Site.**
26	Committee to Minimize Toxic Waste - Sihvola	The commenter asks if LBNL natural gas pipelines located are in the same utility trenches as water, electricity and sewer lines? If so, the commenter requests an EIS analysis of a worst-case scenario of all pipes, exploding, as was the case in San Bruno. Analysis should include availability of water to fight the ensuing fire—if all the water lines were to be destroyed.	The natural gas main would not be relocated in the same trench as water, electricity or sewer. All of the utilities would be relocated to the north of the building site but would be in separate trenches. Safety would be improved with the installation of the new gas piping. The LBNL site is supplied with water from several locations so any damage to one area would not impact the entire site. Also, see **Master Response 4- Gas Main Risk at CRT Site** and **Master Response 3 – Decision to Prepare an Environmental Assessment.** Emergency response at the LBNL site is discussed in **subsection 5.3, Hazards, Human Health and Accidents**.

Comment #	Commenter	Comment Summary	Response
27	Committee to Minimize Toxic Waste - Sihvola	The commenter is concerned with water consumption of the cooling towers of 32 million gallons per year. Comment claims that LBNL rejected EBMUD's recommendation to build a satellite treatment system for recycled water at CRT. The commenter is also concerned with quantity of wastewater from LBNL and the aging of the sewer system in the City of Berkeley.	Water consumption for the proposed CRT facility is discussed in **subsection 5.11, Utilities and Waste Management,** in the EA**.** The water usage associated with the cooling towers is included in the water consumption projections for LBNL. EBMUD has indicated that it can serve future development at LBNL through 2025 with its existing water supply sources (Also see **Response to Comment #60** below). The project includes rainwater harvesting for irrigation and the use of the discharge from the cooling towers in restroom fixtures. In addition, a substantial portion of the cooling tower water would evaporate and not be dumped into the sewer system. The Proposed Action's sanitary sewers would be designed and built to prevent inflow and infiltration, which is the main concern expressed by EBMUD.
28	Committee to Minimize Toxic Waste - Sihvola	The commenter suggests that the CRT facility should be considered as an anchor facility at a second campus.	**Section 5.0, Environmental Consequences** and **Section 6.0, Cumulative Effects**, of the EA provide an analysis of the environmental effects from siting the proposed facility at three off-site locations in Berkeley and Richmond. The EA also includes a discussion about the feasibility of off-site construction. LBNL second site is in the early planning stage. No site has been evaluated or selected at this time and the earliest that a second site could potentially start construction would be in 2015. This timeline is infeasible for the proposed CRT facility. Furthermore, should the second site be located distant from the LBNL site or the UC Berkeley campus, it would not meet the purpose and need of the Proposed Action. As discussed in **Section 2.0, Purpose and Need** of the EA, the existing Oakland Scientific Facility does not have adequate computer room space, mechanical cooling space, or adequate electrical power to meet the purpose and need of the project. See **Master Response 5 - Purpose and Need of the Proposed Action and Alternatives.**
29	Committee to Minimize Toxic Waste - Sihvola	The commenter refers to an attachment submitted as part of the CRT Facility Draft EIR process.	The comments submitted as part of the CRT EIR process are provided in **Table 2, DOE's Responses to Draft EIR Comments,** included in this appendix (**Appendix 4**).
30	Nyingma Institute	The commenter is concerned that the CRT project will adversely affect the institute's residents and programs.	As explained in the EA **subsection 5.9 Noise** and in the responses to the Institute's detailed comments below, the Proposed Action would not adversely affect the Institute's participants and programs. In addition, Standard Project Features Noise-1a, 1b, and 4 are part of the Proposed Action ("SPFs"; see EA Appendix 1) These SPFs would minimize impacts from noise generated by the project's construction activities and noise from mechanical equipment that would be used at the CRT facility, including cooling towers and air handling equipment. Please see detailed responses below.

Comment #	Commenter	Comment Summary	Response
31	Nyingma Institute	The commenter cites the Berkeley Municipal Code Table 13.40-1, which states that the maximum noise level for residential uses is 60 dB(A) between hours of 7 AM and 10 PM, and 55 dB(A) from 10 PM until 7 AM. The Institute quotes the EA, saying that the average noise level at Hearst Avenue and Highland Place by the Nyingma Institute is 64 dB(A), with noise levels ranging from 57 to 80 dB(A). The Institute notes that the existing noise levels in the vicinity already exceed the maximum exterior noise levels for residential uses.	The Berkeley Municipal Code Table 13.40-1 presents the maximum exterior noise levels allowable for residential and commercial land uses. The City uses these noise levels to control the maximum noise from the operation of stationary equipment on one property from adversely affecting adjacent properties. The code (Berkeley Municipal Code Tables 13.40-3 and 4) also controls a project's construction site noise from affecting adjacent properties. The Berkeley Municipal Code excludes noise from vehicular traffic on public streets; the municipal code does not regulate a project's construction or operational traffic noise. The commenter cites EA noise measurements taken at the Hearst Avenue / Highland Place intersection as the noise level to which the Nyingma Institute is currently subjected. The commenter further asserts that this noise is generated "primarily from LBNL" and UC building mechanical systems. Noise measurements taken at the Hearst / Highland Place intersection are only representative of daytime noise conditions at the Nyingma Institute parking lot and façade facing Hearst Avenue. The Nyingma Institute is mostly screened by intervening buildings from much of the traffic noise generated on Hearst Avenue. As reported in Table 4.0-1 in the EA, based on noise measurements conducted on the northeastern side of the Nyingma Institute (the facade that faces the existing LBNL facilities and the CRT site), the ambient noise levels at the Institute are 48 dB(A) Leq with an Lmax of 57 dB(A). Based on field measurements, traffic is determined to be the dominant source of noise affecting the south-facing side of the Institute with some noise contributed by the HVAC systems at the nearby UC facilities and minimal to no contribution of noise from HVAC systems at LBNL facilities as these are too distant from the Institute to affect it. As shown in EA subsections 5.9 and 6.2.9, the project's operational traffic, or the project's traffic in combination with traffic from other projects, would not make an appreciable difference to those existing noise levels – the project's traffic would increase the ambient noise levels by less than 0.5 dB(A) (Illingworth & Rodkin 2010b). Other sources of operational noise associated with the Proposed Action (cooling towers and air handling units) would not add to the noise levels experienced by the south-facing facade of the Nyingma Institute because there would be no direct line of sight between those sources and the south-facing facade of the Institute and also because noise levels generated by the Proposed Action's stationary equipment would meet the City's ordinance requirements at the LBNL property line with the Institute (in accordance with SPF Noise-4) . Also see Response to Comments 34 and 35 below regarding noise from the Proposed Action's stationary equipment See **Response to Comment 33**, below regarding noise impacts from project construction traffic.

Comment #	Commenter	Comment Summary	Response
32	Nyingma Institute	The commenter refers to Table 13.40-2 in the City of Berkeley's noise ordinance and suggests that average interior noise levels are 49 dB(A), with noise levels ranging from 42 to 65 dB(A) as vehicle traffic fluctuates. The Institute states that existing interior noise levels already exceed maximum allowable noise values reported in this table.	As with Table 13.40-1, Table 13.40-2 in the Berkeley Municipal Code does not apply to noise levels generated by vehicular traffic. The project's operational traffic, or the project's operational traffic in combination with traffic from other projects, would not make an appreciable difference in regard to existing noise levels (an increase of 0.5 dB(A) or less). Noise from the Proposed Action's stationary equipment would not add to these interior noise levels for the reasons presented in **Response to Comment 31** above.
33	Nyingma Institute	The commenter finds that the noise currently experienced compromises its operations and expresses concern that added truck traffic and construction noise will compound this problem.	Construction truck traffic along Hearst Avenue that would result from concurrent projects at LBNL was analyzed in **subsection 6.2.9** of the EA. The analysis revealed that these cumulative truck trips would not result in a substantial increase in noise levels along Hearst Avenue (less than 1 dB(A) with an increase of up to 2 dB(A) on a peak day). The noise SPFs would limit noise related to construction trucks during construction of the proposed CRT facility. With respect to construction noise generated at the Proposed Action site, according to the Berkeley Noise Ordinance, construction activities lasting more than 10 days shall not produce noise in excess of 65 dB(A) on adjacent residential properties zoned R-3 during weekdays and in excess of 55 dB(A) during weekends and legal holidays. As the analysis on page 5.0-37 of the EA shows, for most of the construction period, construction noise levels that would be experienced at the Institute (R-3 property) and nearby Foothill student housing complex from construction activities at the CRT site would not exceed 65 dB(A), except for intermittent periods during the short duration of exterior finishing activities (4.5 months) when the project's construction noise levels are conservatively calculated to be 66 dB(A) at the Institute if all exterior finishing activities are occurring at the same time. A one dB(A) exceedance of the 65dB(A) threshold is indistinguishable from the existing noise levels. As described in **subsection 5.9, Noise**, these construction activities would be temporary and short in duration and because construction noise levels would fall within the range of existing ambient noise levels at the Institute, this is not considered an adverse effect.
34	Nyingma Institute	The commenter is concerned about operational noise from the HVAC equipment and cooling towers and requests more explanation.	The EA analyzed the HVAC and cooling tower noise at full buildout with five cooling towers in operation. The cooling towers would be located on the east side of the CRT building. The distance, topography, and building would effectively attenuate noise from the cooling towers that could otherwise potentially affect the Nyingma Institute or any other sensitive receivers in the community. With respect to HVAC noise, LBNL SPF Noise-4, which is incorporated into the Proposed Action, identifies the measures that will reduce noise from HVAC equipment so as to comply with the Berkeley noise ordinance limits. Detailed analyses completed by Charles M Salter Associates in July 2010 indicate that project would comply with the Berkeley noise ordinance limits at the Institute and other off-site residential receptors (Illingworth & Rodkin 2010b).

Comment #	Commenter	Comment Summary	Response
35	Nyingma Institute	The commenter questions that noise from operating cooling towers for the project will be unnoticeable. The commenter is also concerned about the noise levels from this equipment increasing with age.	LBNL SPF Noise-4, which is incorporated into the Proposed Action, identifies the measures that will reduce noise from HVAC equipment so as to comply with the Berkeley noise ordinance limits. Also please see Responses to Comments 33 and 34 above. The noise analysis in the EA considered the future full build out of the facility when it analyzed the noise impacts from computational equipment and its cooling needs.
36	Nyingma Institute	The commenter requests to reduce noise at the source and direct it away from residential uses.	Comment noted. Also please see **Responses to Comments 33** and **34** and LBNL SPF Noise-4 for a list of features that are incorporated into the project to control noise levels which would result in noise levels not exceeding the Berkeley noise ordinance limits at the LBNL property line. The UC LBNL commits to considering concerns expressed by its neighbors, including the Institute, and to work to identify mutually beneficial solutions which address concerns.
37	Nyingma Institute	The commenter suggests potential noise mitigation, including a sound wall to block construction noise, possible relocation of CRT and HVAC units on the new building to minimize the noise at the Nyingma Institute	Please see **Response to Comments** #**33** through **35** above.
38	Save Strawberry Canyon	The commenter states that the CRT has the potential to significantly affect the quality of the environment, that the DEA is insufficient, and there needs to be a full discussion of impacts and alternatives, and therefore an EIS is warranted.	See **Master Response 3 – Decision to Prepare an Environmental Assessment**, which explains why the preparation of an Environmental Assessment is appropriate for this Proposed Action, and what the procedures and criteria are required for the preparation of an EIS. The CRT EA is a complete and thorough analysis that fully complies with all applicable NEPA requirements. The EA analyzes and discloses the effects from the implementation of not just the Proposed Action but also five other alternatives, including three off-site alternatives.
39	Save Strawberry Canyon	The commenter states that the proposed site is not suitable for CRT. SSC also claims that an EIS is needed that provides a discussion of viable off-site alternatives.	As noted above, **Section 5.0, Environmental Consequences** and **Section 6.0, Cumulative Effects,** in the EA includes an evaluation of the impacts of developing the proposed facility at three off-site locations. See **Master Response 3 – Decision to Prepare an Environmental Assessment**,
40	Save Strawberry Canyon	The commenter states that the project site is a part of a continuous landscape that the organization is eager to preserve and protect.	The commenter's characterization of the site as being "notable for its stretch of natural terrain…." and of being "a visual resource of significance" is not supported by the first-hand site investigations conducted for the EA analysis. The project would be located in an area that is surrounded by other LBNL facilities on a site that has previously been disturbed in conjunction with road and utility construction. See **Master Response 6 - Visual Quality of the Proposed Action Site**.

Comment #	Commenter	Comment Summary	Response
41	Save Strawberry Canyon	The commenter states that if a building were constructed at the site, a visual resource of significance would be lost. Also, an associated biological resource would be lost. The cumulative effects of the development of the site must be analyzed.	**Subsection 5.6, Visual Resources** in the EA, describes the visual impacts from developing the CRT building at the proposed site. Biological and cumulative impacts of the Proposed Action are addressed in **subsection 5.4, Biological Resources** and **Section 6.0, Cumulative Effects**. See also **Master Response 6-Visual Quality of the Proposed Action Site**.
42	Save Strawberry Canyon	The commenter states that the previous concerns expressed with respect to the project should have been an indication to the DOE that this project needs a full assessment of impacts to resources.	See **Master Response 3 – Decision to Prepare an Environmental Assessment.**
43	Save Strawberry Canyon	The commenter states that the geology of the CRT site and its proximity to the Hayward fault is a concern. SSC asserts that the LBNL Helios Energy Research Facility project EIR was decertified due to the problem of colluvial material underneath the building footprint.	See **Master Response 1 - Geological Conditions Underlying the LBNL Site,** and **Master Response 2, Site-Specific Geotechnical Considerations.** The commenter's assertion as to why the EIR for the LBNL's Helios Energy Research Facility project was decertified is not accurate nor relevant to this EA. The Helios EIR was decertified because the project team concluded that the revision to project design was sufficiently substantial to warrant submittal of a revised design to the Regents for approval following analysis in and certification of a new EIR.
44	Save Strawberry Canyon	The commenter refers to **subsection 4.2, Issues Determined to Warrant Further Consideration in the EA.**	As the commenter notes, the EA does analyze geology and soil impacts for the proposed action and alternatives.
45	Save Strawberry Canyon	The commenter states that the geotech reports were not prepared for the project as proposed and more geotechnical investigations are needed which will prove that no building should be constructed on this site. An EIS must evaluate the reality of this site's conditions.	Site geology is discussed and analyzed in **subsections 4.2.1** and **5.1, Geology and Soils** in the EA. See **Master Response 2- Site-Specific Geotechnical/Geologic Considerations.** See **Master Response 3 – Decision to Prepare an Environmental Assessment.**
46	Save Strawberry Canyon	The commenter summarizes the WLA (William Lettis and Associates) peer review of the 2006 Kleinfelder fault investigation. The comment states that WLA is concerned with inadequate discussion of the shear zones and clay shear seams, their orientation, and their use in interpreting landslide versus faulting. Comment states that WLA noted that Kleinfelder wrote that no shear or offsets of the layers were observed in trenches. Comment claims that Kleinfelder and WLA do not agree and that Kleinfelder contradicts itself.	See **Master Response 2 –Site-Specific Geotechnical/Geologic Considerations.** Kleinfelder is not contradicting itself or contradicting WLA as the comment suggests. All questions raised by WLA have been adequately answered to the agreement of WLA. In fact, the initial paragraph in Kleinfelder's response letter to WLA's comments states, "WLA indicates that they are in agreement with our conclusions that active faulting does not exist beneath the CRT building site." WLA further states that the Kleinfelder study was performed adequately for the purposes of the proposed project and that "The study, as well as previous studies, document that the primary active fault zone of the Hayward fault lies west of the proposed CRT footprint."

Comment #	Commenter	Comment Summary	Response
47	Save Strawberry Canyon	The commenter states that two probes made by California Geological Survey indicate faults around or under the footprint of the project site.	Site geology is discussed and analyzed in **subsections 4.2.1** and **5.1, Geology and Soils** in the EA. See **Master Response 2 –Site-Specific Geotechnical/Geologic Considerations.** The Kleinfelder (2006) fault investigation includes Plate 6 that shows the general outline of previously performed fault studies in the vicinity of the proposed CRT project site. Kleinfelder reviewed the available information from CGS and verified that no probes or borings were performed by CGS at the project site.
48	Save Strawberry Canyon	The commenter suggests that there are problems with the Kleinfelder reports, including the map from the fault investigation, which marks and identifies borings, trenches, pits and other important material. 1. Comment finds that the Kleinfelder report does not discuss Fugro's seismic refraction study, or what it revealed of faults. 2. Comment states that GeoResource borings are included but not cited on the map, so are useless. 3. 2006 Blackberry Gate borings by Kleinfelder are shown on the map but are not mentioned in the reports. Comment notes that these were near or at the Proposed Action footprints. 4. There are no images or analyses for 2 Fugro trenches, which are close to the proposed building footprint.	Site geology is discussed and analyzed in **subsections 4.2.1** and **5.1, Geology and Soils** in the EA. See **Master Response 2 –Site-Specific Geotechnical/Geologic Considerations.**
49	Save Strawberry Canyon	The commenter states that Fugro borings in the northern part of the footprint are different from the borings by Kleinfelder. Specifically, the commenter finds that Fugro B-1 and B-2 show clay to 10 feet and to 15 feet then sandstone to the bottoms of both borings (27 feet). Kleinfelder No. 1 has clay to 7 feet, siltstone to 18 feet, then shale. KB-3 has siltstone to 9 feet, sandstone to 12 feet, siltsone to 27 feet and then shale. (KB-2 struck a concrete conduit.)	See **Master Response 2 –Site-Specific Geotechnical/Geologic Considerations.** It appears as though the comment by SSC mistakenly calls out Kleinfelder boring KB-3, rather than K-3.The lithologic differences between the various Fugro and Kleinfelder borings presented in Master Response 2 are consistent with the site conditions and what would be expected based on natural and man-made conditions at the specific boring locations.

Comment #	Commenter	Comment Summary	Response
50	Save Strawberry Canyon	The commenter notes that Kleinfelder proposed a design for a previous CRT facility that shows no interior piers or few piers for maximum flexibility. SSC finds that this may result in movement during a seismic event and sites to Moffitt Library as an example of a building constructed without interior walls that had to be reinforced at the corners. SSC suggests this reinforcement may not be enough to prevent the loaded floors from pancaking.	See **Master Response 2 –Site-Specific Geotechnical/Geologic Considerations.**
51	Save Strawberry Canyon	The commenter states that the piers should extend into "bedrock." Most piers depicted in the Kleinfelder report are less than 10 feet deep. In other parts of the report, the piers extend to the colluvium, the fill above the landslide. The landslide and the clay slip seam beneath it must be removed and replaced with a better quality fill, about 10 feet in depth. The SSC finds that the piers will not reach the siltstone and notes that siltstone is expansionary.	See **Master Response 2 –Site-Specific Geotechnical/Geologic Considerations.**
52	Save Strawberry Canyon	The commenter states that site grading for CRT would result in 60,000 cubic yards of cut and fill and the resultant truck trips would be between 6,000 and 4,000 round trips, resulting in noise and air impacts.	The EA presents the total amount of cut and fill on page 3.0-11, which is estimated at 15,500 cy of cut and 12,200 cy of fill for a total of 27,700 cy (and not 60,000 cy as erroneously estimated by the commenter). The truck trips associated with this cut and fill are also reported on page 3.011 and 3.0-12, and are substantially below the number estimated by the commenter. As noted in the EA, the total number of daily truck trips from all concurrent LBNL construction projects are controlled so as not to exceed 98 one-way truck trips per day. The noise, traffic, and air quality impacts from this number of daily truck trips were evaluated and are reported in the EA in **subsection 6.2.9, Noise, and subsections 5.7, Air Quality,** and **5.10, Transportation and Traffic**.
53	Save Strawberry Canyon	The commenter states that the slope stabilization and pier construction would cost as much as the building itself.	The location of the Proposed Action was chosen to best meet the Proposed Action's stated purpose and need, as well as to reasonably meet feasibility and budgetary considerations. See **Master Response 5 - Purpose and Need of the Proposed Action and Alternatives.**
54	Save Strawberry Canyon	The commenter states that the Draft EA does not describe the gas main that would be relocated by the project. In light of the recent gas main related explosion in San Bruno, the commenter is concerned about potential explosion-related risk from the gas main.	See **Master Response 4– Gas Main Risk at CRT Site.** The EA has been revised to provide a description of the gas line modifications and impacts (see **subsections 3.1.6, Utilities and Infrastructure**, and **4.2.11** and **5.11, Utilities and Waste Management).**

Comment #	Commenter	Comment Summary	Response
55	Save Strawberry Canyon	The commenter states that an EIS should be prepared.	See **Master Response 3 – Decision to Prepare an Environmental Assessment.**
56	Strawberry Creek Watershed Council - Schemmerling	The commenter states that the Draft EA is not adequate and an EIS should be prepared.	See **Master Response 3 – Decision to Prepare an Environmental Assessment.**
57	Strawberry Creek Watershed Council - Schemmerling	The commenter states that the EIS should include information about the 6-inch gas main and noise from the operation of cooling towers.	See **Master Response 4– Gas Main Risk at CRT Site.** With respect to operational noise, the noise levels resulting from the operation of on-site equipment such as cooling towers and HVAC are discussed in **subsection 5.9, Noise,** of the EA and **Response to Comment 34**. See **Master Response 3 – Decision to Prepare an Environmental Assessment.**
58	Strawberry Creek Watershed Council - Schemmerling	The commenter states that the EA must include water use and wastewater generation data, which should be reviewed by the appropriate agency.	The EA presents both the daily and annual water consumption associated with the proposed project in **subsection 3.1.6, Utilities and Infrastructure,** and discusses the ability of EBMUD to provide this water to the LBNL site in **subsection 5.11, Utilities and Waste Management,** of the EA. The project's water demand is well within the volume of water that EBMUD has committed to provide to LBNL from its existing supply sources. The EA also presents the total amount of wastewater that would be generated daily and on an annual basis by the proposed project in **subsection 3.1.6**. Impacts on EBMUD's treatment capacity are described in **subsection 5.11**. As the wastewater amounts generated by the project are within the capacity of the treatment facilities, the flows from the project would not adversely affect the waters of the Bay. Please note that EBMUD reviewed and commented on the Draft EA. EBMUD has not expressed any concern about the project's water consumption or wastewater generation (see **Comments 3** through **5**).
59	Strawberry Creek Watershed Council - Schemmerling	The commenter states that the project is located on landslide prone soils in the Hayward fault zone.	See **Master Response 2- Site-Specific Geotechnical/Geologic Considerations**.
60	Strawberry Creek Watershed Council - Schemmerling	The commenter asks how the project will affect Cafeteria Creek, which contributes flows to Strawberry Creek.	**Subsection 3.1.6, Utilities and Infrastructure,** in the EA provides a description of how stormwater generated at the project site would be collected and discharged. Hydromodification effects are evaluated in **subsection 5.2, Water Resources.** The Proposed Action would not affect Cafeteria Creek. Storm water would be controlled and directed away from Cafeteria Creek and towards on-site retention facilities. After retention in these hydromodification vaults, the stormwater would be discharged into the storm drain in Cyclotron Road. The existing storm drain in Cyclotron Road discharges into the North Folk of Strawberry Creek. The runoff from the CRT site would discharge into the North Fork of Strawberry Creek, but because it would be detained and discharged at a rate such that the post development flows from the site approximate pre-development flows, the site runoff would not cause scour or erosion in the receiving waters.

Comment #	Commenter	Comment Summary	Response
61	Strawberry Creek Watershed Council - Schemmerling	The commenter notes that the Draft EA plans for the removal of the building after it becomes obsolete. Comment asks why construct a massive facility on such a steeply sloped, undeveloped site, to then have to remove it.	DOE's Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements (DOE 2004) recommend that an EA disclose the environmental consequences from the construction, operation, decommissioning and removal of a proposed project. It is in that context that the EA discusses the eventual closure and removal of the building and the foreseeable effects of these actions. The decommissioning and removal are not related to the proposed site specifically. As with any building that eventually becomes obsolete, the proposed building will require upgrading or removal. The removal or replacement of the project would occur no matter what site is eventually chosen for the proposed facility.
62	Strawberry Creek Watershed Council - Schemmerling	The commenter asks about the total construction budget for the project at the proposed site.	The proposed project's total construction budget is $75 million.
63	Strawberry Creek Watershed Council - Schemmerling	The commenter asks as to what the total construction budget would be for constructing the project at the alternate sites.	Although the Proposed Action and the alternatives meet DOE's purpose and need, the Proposed Action meets certain additional screening criteria that best suit DOE's NERSC programmatic goals (see EA **subsection 2.2.4**). Since the alternatives did not meet these additional screening criteria, the construction budgets for the alternative sites were not fully evaluated.
64	Strawberry Creek Watershed Council - Schemmerling	The commenter asks whether an independent review been done of the cost/benefit ratios of each alternative site.	Evaluation of the No Action alternative provides a baseline that a reader or the decision maker can use to make comparisons as to the environmental impacts for the Proposed Action and alternatives. Cost can be a factor of consideration in a NEPA document, but there is not a requirement to consider costs.
65	Strawberry Creek Watershed Council - Schemmerling	The commenter expresses concern about the public health effects of the proposed project and requests LBNL employee health data.	The comment is noted. It appears that this comment is beyond the scope of the EA, as the EA only evaluated the environmental impacts of hazards from the Proposed Action and alternatives at the LBNL site, RFS site, former DHS site and the San Pablo Avenue site – not the entire LBNL campus -- for which data is being requested by the commenter.
66	Bernardi (Committee to Minimize Toxic Waste) (Poster Session)	The commenter is concerned with how the poster session was noticed and how the meeting session was set up with no chairs.	Comment noted. DOE NEPA implementing regulations do not require a public meeting in the case of an EA. However, because DOE wishes to provide members of the public an opportunity to participate in the EA process, DOE provided a time for the public to ask questions and express concern. In addition, even though not required by the regulations, DOE allowed the public the opportunity to comment on the Draft EA for 30 days after issuance. (10 CFR 1021.301)

Comment #	Commenter	Comment Summary	Response
67	Bernardi (Committee to Minimize Toxic Waste) (Email)	The commenter states that the proposed project should not be located in Strawberry Canyon, next to dormitories and in the Alquist-Priolo Earthquake Zone. Proposed project should be located at an alternate site.	See **Master Response 5 – Purpose and Need of the Proposed Action and Alternatives.** Comment noted. The EA includes an evaluation of three off-site locations for the proposed facility and an alternate location on the LBNL site, as well as the No Action alternative.
68	Bernardi (Committee to Minimize Toxic Waste) (Email)	The commenter is concerned with disaster related to the gas and water lines near the project site. The commenter requests an EIS be prepared.	See **Master Response 4– Gas Main Risk at CRT Site** and **Master Response 3 - Decision to Prepare an Environmental Assessment.**
69	Curtis	The commenter is concerned with a map of planned construction on the LBNL hill campus and notes that one site on the west side of the existing buildings is on Great Valley Sequence Cretaceous beds. He notes that there are fine-grained sandstones interbedded with shale beds ranging from a few inches thick to a foot or more in thickness. The shale is composed of altered flakes of mica and silt grains. These beds at this locality dip westward at angles of 30 to 40 degrees as can be seen in outcrops in the gullies. The commenter notes that the slope is very steep, and there are numerous scars of small landslides from landslide debris having been washed away quickly.	See **Master Response 2 –Site-Specific Geotechnical/Geologic Considerations.**
70	Curtis	The commenter states that two factors are involved in causing the CRT site slope to be so steep: one is the slow uplift of the rocks on the east side of the Hayward fault, leaving a fault scarp, and the other is the steep westward dip of the strata composing the slope.	See **Master Response 2 –Site-Specific Geotechnical/Geologic Considerations.** Certainly, the slope is the result of uplift to the east of the Hayward fault. Maximum tectonic uplift rates throughout the Bay Area are thought be less than 1 mm/yr, or 1 m/thousand years (Ferritti et al. 2004), and these maximum rates do not occur at the project location. Scientifically, it would seem more logical that a rapid uplift rate would correspond to steep slopes rather than a slow uplift. Current research indicates that the west side of the Hayward fault is experiencing uplift relative to the east side in the vicinity of the project, which indicates the slope will not be steepened further by uplift (Williams 1992).
71	Curtis	The commenter states that slopes to the north and south of the CRT location are generally less steep than this one and goes on to note that this is unfortunate because it has been an initiation for homes to be constructed on them with inadequate support.	Comment noted. The construction of residences throughout slopes both north and south of LBNL is outside the scope of this environmental analysis.

Comment #	Commenter	Comment Summary	Response
72	Curtis	The commenter is concerned with the strength of the westward dipping shale rocks that the proposed building will rest on, particularly during a strong earthquake when the rocks are water-soaked. The commenter asserts there should be more suitable sites for the Proposed Action.	See **Master Response 2 – Site-Specific Geotechnical/Geologic Considerations.** Also, refer to **Master Response 5 - Purpose and Need of the Proposed Action and Alternatives.**
73	Eiseley	The commenter expresses opposition to the project.	Comment noted.
74	Eiseley	The commenter expresses concern about the risk associated with the caldera.	See **Master Response 1 – Geological Conditions Underlying the LBNL Site.**
75	Fairfield	The commenter refers to protecting Strawberry Canyon as a natural resource and alludes to destruction of vegetation and wildlife habitat. The commenter requests that an EIS be prepared.	Effects on vegetation and wildlife habitat associated with the Proposed Action are described in **subsection 5.4, Biological Resources**, in the EA. Please see **Master Response 3 – Decision to Prepare an Environmental Assessment**, which explains the process for determining whether and when an EIS becomes necessary for NEPA review of a Proposed Action.
76	Grassetti	The commenter refers to the risk associated with slope stability from building within the Alquist-Priolo Earthquake Hazard Zone.	A discussion of seismic landslide hazards at the project site is located in **subsection 5.1, Geology and Soils**, of the EA. Also see **Master Response 1 – Geological Conditions Underlying the LBNL Site,** and **Master Response 2 –Site-Specific Geotechnical/Geologic Considerations.**
77	Grassetti	The commenter states that the Richmond site is better suited for the proposed facility, without the risk factors inherent at the Proposed Action site.	See **Master Response 5- Purpose and Need of the Proposed Action and Alternatives.**
78	Grassetti	The commenter claims that the slope of sandstone and shale that underlies most of the buildings of the LBNL site is unstable because it is on the western edge of a caldera created 10 million years ago by volcanic eruption. Increased instability and landslides can be expected due to extreme weather events, including intense rainfall, related to climate change. The commenter provides an example of a storm that brought down trees and caused landslides in the North Hills and Berkeley Hills. Comment provides a weblink to a landslide hazard map at the LBNL site that shows historical and potential landslides. The commenter asserts that an extreme rainfall event could cause a catastrophic slide.	See **Master Response 1 – Geological Conditions Underlying the LBNL Site** and **Master Response 2 – Site Specific Geologic/Geotechnical Conditions.**

Comment #	Commenter	Comment Summary	Response
79	Grassetti	The commenter notes that the Proposed Action site lies within the Alquist-Priolo Earthquake Fault Zone. Comment notes that an earthquake of magnitude 6.8 to 7.0 is increasingly probable on the Hayward fault within the next 30 years and that a large earthquake could cause earth flows down onto Foothill housing and beyond that into the City of Berkeley.	See **Master Response 1 – Geological Conditions Underlying the LBNL Site** and **Master Response 2 - Site-Specific Geotechnical/Geologic Considerations**.
80	Grassetti	The commenter asserts that there would be a fire risk at the Proposed Action site due to inadequate firefighting capabilities.	See **Master Response 7 – Risk of Wildland Fire at the CRT Site**. As noted by the commenter, FEMA funding is sought by UC Berkeley for controlling an area overgrown with eucalyptus trees on UC Berkeley managed land. Such areas at LBNL have already undergone vegetation management, with support provided by DOE. In addition, UC Berkeley does not have the on-site firefighting resources that LBNL maintains, including an on-site fire station and multiple 200,000-gallon water tanks for fire suppression purposes. Thus, the commenter's characterization of LBNL's firefighting capabilities as being the same as UC Berkeley's is not correct, nor is it accurate to compare the wildland fire risk at the entire LBNL site with one area of UC Berkeley managed wildlands.
81	Grassetti	The commenter states that an EA review is not robust enough for a project of this size, especially considering cumulative impacts. The comment cites examples of cumulative projects such as FEMA PDM-PJ-CA-2005-003 and -001, PDM-PJ-CA-2006-004, HMGP 1731-16-34, and the EBRPD Measure CC projects (State Clearinghouse #2008042099). `	See **Master Response 3 – Decision to Prepare an Environmental Assessment.** The FEMA projects referred to by the comment are described in subsection Vegetation Management Projects, in **subsection 6.1, Construction Projects Near the Proposed Action**. The analysis in the EA considered these projects in its cumulative analysis. Specifically, the cumulative effects related to wildland fire are described in **subsection 6.2.3, Hazards, Human Health, and Accidents**. The East Bay Regional Parks District (EBRPD) Wildfire Hazard Reduction and Resource Management Plan provides for treatment of vegetation in Tilden Regional Park, which is also near the LBNL site.
82	Grassetti	The commenter states that an EIS is needed to fully evaluation environmental risks of the Proposed Action and Alternatives.	See **Master Response 3 – Decision to Prepare an Environmental Assessment**.
83	Hakimoglu	The commenter expresses opposition to the project	Comment noted.
84	Hovland	The commenter refers to the risk associated with slope stability from building within the Alquist-Priolo Earthquake Hazard Zone.	A discussion of seismic landslide hazards is located in **subsection 5.1, Geology and Soils** of the EA. Please see **Master Response 2 - Site-Specific Geotechnical/Geologic Considerations.**

Comment #	Commenter	Comment Summary	Response
85	Hovland	The commenter claims that the slope of sandstone and shale that underlies most of the buildings of the LBNL site is unstable because it is on the western edge of a caldera created 10 million years ago by volcanic eruption. Increased instability and landslides can be expected due to extreme weather events, including intense rainfall, from climate change. The commenter provides an example of a storm that brought down trees and caused landslides in the North Hills and Berkeley Hills. The commenter provides a weblink to a landslide hazard map at the LBNL site that shows historical and potential landslides. The commenter asserts that an extreme rainfall event could cause a catastrophic slide.	See **Master Response 1 – Geological Conditions Underlying the LBNL Site** and **Master Response 2 - Site-Specific Geotechnical/Geologic Considerations.**
86	Hovland	The commenter notes that the Proposed Action site lies within the Alquist-Priolo Earthquake Fault Zone. Comment notes that an earthquake of magnitude 6.8 to 7.0 is increasingly probable on the Hayward fault within the next 30 years. A large earthquake could cause earth flows down onto Foothill housing and beyond that into the City of Berkeley	See **Master Response 1 – Geological Conditions Underlying the LBNL Site** and **Master Response 2 - Site-Specific Geotechnical/Geologic Considerations.**
87	Hovland	The commenter refers to constructing within the Alquist-Priolo Earthquake Fault Zone, and asserts that the building would experience a high degree of shaking and damage, and could break apart, even if constructed to today's earthquake standards.	See M**aster Response 2- Site-Specific Geotechnical/Geologic Considerations**. The potential environmental effects related to seismic shaking are described in **subsection 5.1, Geology and Soils**.
88	Hovland	The commenter refers to wildland fire risk in the Berkeley Hills.	See **Master Response 7 – Risk of Wildland Fire at the CRT Site.**
89	Hovland	The commenter expresses concern regarding fire spreading to hazardous waste facilities and abandoned buildings that contain contaminated materials.	The proposed CRT facility is not a hazardous waste facility, nor would it store hazardous materials that are not properly contained. See **subsection 5.3, Hazards, Human Health, and Accidents**, for a description of hazardous materials associated with the Proposed Action. See **Master Response 7 – Risk of Wildland Fire at the CRT Site.**
90	Hovland	The commenter is concerned about risk of fire from grassland.	See **Master Response 7 – Risk of Wildland Fire at the CRT Site.**

Comment #	Commenter	Comment Summary	Response
91	Hovland	The commenter describes the cumulative development in Strawberry and Blackberry Canyons.	The EA evaluates cumulative impacts of growth in the area surrounding the Proposed Action and alternative sites in **Section 6.0, Cumulative Effects**. Effects related to water supply are also described in that section.
92	Hovland	The commenter refers to protecting Strawberry Canyon as a natural resource and alludes to destruction of vegetation and wildlife habitat.	Comment noted.
93	Hovland	The commenter states that the facility should be sited at alternative sites in Berkeley, Oakland or Richmond.	See **Master Response 5- Purpose and Need of the Proposed Action and Alternatives.**
94	Hovland	The commenter expresses a concern about the relationship between town and gown.	Comment noted.
95	Hovland	The commenter states that an EIS should be prepared.	See **Master Response 3 – Decision to Prepare an Environmental Assessment.**
96	Legg	The commenter refers to dangers from earthquakes and landslides at the project site.	See **Master Response 2 - Site-Specific Geotechnical/Geologic Considerations.**
97	Legg	The commenter is concerned with the choice of site.	See **Master Response 5 – Purpose and Need of the Proposed Action and Alternatives** and **Master Response 2 –Site-Specific Geotechnical/Geologic Considerations.**
98	Matis	The commenter states that consolidation of the various programs at the project site would reduce the traffic in Berkeley and therefore would reduce global warming. The comment is in support of the project.	Comment noted.
99	Miller	The commenter states that construction in Strawberry Canyon is unsafe. Comment expresses opposition to the project.	The hazards associated with the Proposed Action site are evaluated in **subsection 5.3, Hazards, Human Health, and Accidents** of the EA. Geological hazards are evaluated in **subsection 5.1, Geology and Soils.** See also **Master Response 1 – Geological Conditions Underlying the LBNL Site.**
100	Miller	The commenter generally refers to unstable ground, fire, earthquake and limited access near the location for the Proposed Action.	Comment noted.
101	Sarachan	The commenter states that the project site is dangerous. Comment is concerned with potential gas line rupture.	See **Master Response 4– Gas Main Risk at CRT Site.**

Comment #	Commenter	Comment Summary	Response
102	Sarachan	The commenter notes that a sub-grade-6-inch medium-pressure natural gas main crosses the project site. The commenter claims that this is a fact of major significance. 1. Comment disagrees with conclusion in the EA that potential effects related to seismicity, landslides and erosion is "minor" 2. The gas main is subject to extreme movement/shock. 3. Soils supporting the gas main are potentially shifting and unstable shale and sandstone and are subject to settling.	See **Master Response 2 – Site-Specific Geotechnical/Geologic Considerations** and **Master Response 4– Gas Main Risk at CRT Site.**
103	Sarachan	The commenter states that an EIS should be prepared.	See **Master Response 3 – Decision to Prepare an Environmental Assessment.**
104	Sarachan	The commenter refers to an attachment submitted as part of the CRT Facility Draft EIR process.	The comments submitted as part of the CRT EIR process are provided in the **DOE's Responses to Draft EIR Comments,** included in this appendix.
105	Scott	The commenter notes disagreement with conclusion in EA that environmental impacts of the Proposed Action would be "minor."	Comment noted. The NEPA review is a process in which environmental impacts are assessed and agency and public comments are also taken into consideration before the decision maker decides whether the impact is indeed minor. Also see **Master Response 3 – Decision to Prepare an Environmental Assessment.**
106	Scott	The commenter refers to the traffic impacts from the addition of 300 employees to the LBNL site due to the proposed project.	The EA evaluates the effects of employee traffic in **subsection 5.10, Transportation and Traffic** in the EA. As shown in the analysis, traffic associated with the CRT facility would not cause an exceedance of the significance thresholds for traffic impacts established by the City of Berkeley. As discussed in **subsection 3.1.8, Project Population,** all 300 employees would not be new to the LBNL site. Approximately 165 persons would be existing LBNL employees currently located in other LBNL buildings; these persons already travel to the lab by car or transit and therefore would not result in new vehicles trips.
107	Scott	The commenter is concerned with the earthquake threat at Proposed Action site.	See **Master Response 2 – Site-Specific Geotechnical/Geologic Considerations.**
108	Scott	The commenter disagrees with the purpose of the project.	See **Master Response 5 – Purpose and Need of the Proposed Action and Alternatives.**

Comment #	Commenter	Comment Summary	Response
109	Scott	The commenter disagrees with the finding that the impact from tree removal will be minor.	**Subsections 4.2.4** and **5.4, Biological Resources,** of the EA present the type of habitat that exists on the project site. The eucalyptus trees are not native trees and are also highly flammable. The annual grassland on the site is also composed of non-native species. The removal of this vegetation would reduce the fire risk in the area. With respect to the potential for erosion following the clearing of trees, the cleared area would be developed with the building and roadway. Any areas not under paved surfaces would be landscaped. Erosion control measures would be put in place during project construction to avoid and minimize erosion. The EA acknowledges that the removal of site trees would result in some loss of carbon sequestration. However, the proposed project would replace the non-native eucalyptus trees with native trees at a 1:1 ratio.
110	Scott	The commenter states that an EIS should be prepared.	See **Master Response 3 – Decision to Prepare an Environmental Assessment.**
111	Sharp	The commenter requests that the EA comment period should be extended and another public information session should be considered.	DOE NEPA implementing regulations require DOE to provide state government and tribes 14 to 30 days to review and comment an EA. Here, DOE provided the full 30 days for comment review. In addition, while DOE regulations do not require consultation with the general public on EAs, DOE not only invited the public to review and comment on the EA but also provided an opportunity for the public to attend a information poster session which was conducted on September 20, 2010.
112	Taylor	The commenter expresses opposition to the project.	Comment noted.
113	Thompson	The commenter states that the CRT building would loom over the commenter's neighborhood and that Strawberry Canyon is being overbuilt.	The CRT site is not in Strawberry Canyon. The proposed CRT building would not be visible from Strawberry Canyon, nor from most or all surrounding residential neighborhoods. Consequently, DOE disagrees with the commenter's assertion that the CRT building would be viewed as "looming over" the commenter's – or any neighboring – residences, particularly those in Strawberry Canyon. Visual resources are evaluated in **subsection 5.6, Visual Resources** in the EA. Also see **Master Response 6 – Visual Quality of the Proposed Action Site.**
114	Thompson	The commenter states that the project site is too close to the Hayward fault. Also the site is in an area that will likely experience seismic ground failures that would affect homes downslope.	See **Master Response 2 – Site-Specific Geotechnical/Geologic Considerations.**
115	Thompson	The commenter notes that the Leased Facility on San Pablo appears to be the most reasonable alternative.	See **Master Response 5- Purpose and Need of the Proposed Action and Alternatives.**
116	Woodcock	The commenter expresses opposition to the project.	Comment noted.

Comment #	Commenter	Comment Summary	Response
117	Woodcock	The commenter is concerned with buildings near the Hayward Fault, ecologically sensitive area, and potential for slides.	A discussion of seismic landslide hazards at the project site is located in **subsection 5.1, Geology and Soils** of the EA. The site biology is evaluated in **subsection 5.4, Biological Resources.** Also, see **Master Response 2 – Site-Specific Geotechnical/Geologic Considerations.**

DOE's Responses to CRT Draft EIR Comments

Comment #	Comment Summary	UC EIR Response	DOE Response
Letter from Committee to Minimize Toxic Waste on the CRT Draft EIR			
1	The commenter is concerned with the size of the facility and the location near the Hayward fault, within the Alquist-Priolo Earthquake Fault Zone, the steepness of the hillside, and accessibility of the site.	The Draft EIR identifies the project's location relative to the Hayward fault and within the associated Alquist-Priolo Zone (see Section 4.5, Geology and Soils, page 4.5-4). Project site access is described in Section 3.0, Project Description, and emergency access and evacuation routes are discussed in Section 4.6, Hazards (pages 4.6-12 to 4.6-13).	See **Master Response 2 – Site-Specific Geotechnical/Geologic Considerations.** In addition, emergency access and evacuation routes are discussed in **subsections 4.2.3** and **5.3, Hazards, Human Health, and Accidents**.
2	The commenter requests that the NERSC Center remain at the Oakland Scientific Facility site in Oakland.	The NERSC facility in Oakland does not meet the following programmatic requirements: (1) provide an integrated and appropriately designed facility for advanced research in computational science and engineering; (2) foster interaction and collaboration between the project and UC Berkeley programs; (3) provide adequate space to accommodate next-generation computing equipment and allow for regular upgrades to such equipment; and (4) provide a reliable power source for the project's computer equipment needs. The NERSC facility does not have the electrical capacity to allow for it to remain in Oakland beyond the current lease and lifetime of current equipment, which is due to be replaced in 2009, and again in 2011. Next-generation computer equipment scheduled to be installed at that time to allow research programs to continue would require more electricity than is available at the current site.	See **Master Response 5 – Purpose and Need of the Proposed Action and Alternatives.**

Comment #	Comment Summary	UC EIR Response	DOE Response
3	The commenter requests consideration of the Richmond Field Station site for all UC/LBNL Computational Science and Engineering Program facilities.	The Richmond Field Station was evaluated and eliminated as an option because it does not meet the CRT project objectives to expand functionality of Lab facilities, provide for cross-disciplinary research, or foster collaborative work environments among researchers. The Richmond site does not provide accessibility to a large, reliable, and economical electrical power source. Please see **Master Response No. 1, Alternative Site – Richmond Field Station**.	The EA evaluates environmental effects from developing the CRT facility at the Richmond Field Station site throughout **Section 5.0, Environmental Consequences**. Also, see **Master Response 5 – Purpose and Need of the Proposed Action and Alternatives.**
4	The commenter states that the Proposed Action site is "virgin land" in the Strawberry Creek Watershed and should be preserved. Cafeteria Creek should be preserved and improved.	As noted in **Response to Comment ORG-1-2** above, although the specific location within the LBNL campus in which the CRT project is proposed is currently undeveloped, the site is not virgin land. It has been previously disturbed and is predominantly vegetated with non-native eucalyptus trees. The site is in an area of the hillside that is developed with institutional and laboratory buildings of various scales interspersed with groupings of native and non-native trees and grassland. The proposed project would not include any structures or grading within Cafeteria Creek and would include a 50-foot setback from the creek for construction activities (see Draft EIR page 3.0-19). The proposed project would not drain to the open channel of Cafeteria Creek (above Cyclotron Road).	Although the specific location within the LBNL campus in which the CRT project is proposed is currently undeveloped, the site is not virgin land. It has been previously disturbed and is predominantly vegetated with non-native eucalyptus trees. The site is in an area of the hillside that is developed with institutional and laboratory buildings of various scales interspersed with groupings of native and non-native trees and grassland. The proposed project would not include any structures or grading within Cafeteria Creek and would include a 50-foot setback from the creek for construction activities, as stated in **Section 3.0** of the EA. The proposed project would not drain to the open channel of Cafeteria Creek (above Cyclotron Road).

Comment #	Comment Summary	UC EIR Response	DOE Response
5	The commenter states that the Draft Environmental Impact Report (EIR) is deficient with regard to addressing earthquake and landslide hazards. CMTW and other community groups expressed these concerns during the CEQA process for the Building 49 project.	LBNL disagrees with the statement that the CRT Draft EIR is deficient with regard to addressing potential hazards related to landslides and earthquakes. Geologic and seismic hazards are discussed in Section 4.5, Geology and Soils. With regard to comments previously submitted for the earlier proposed B49 project, the commenter's October 31, 2003 letter addresses a different project from the presently proposed CRT project and does not include comments on the adequacy of the present CRT Draft EIR, and all of the environmental topics raised in the letter are addressed in the Draft EIR for the CRT project. The letter is included in the material that will be made available to The Regents for their review and consideration of the CRT EIR.	Comments regarding the Bldg. 49 project do not address the Proposed Action, its alternatives, or the adequacy of the EA, thus no further response is warranted. The EA does address concerns regarding geology. See **Master Response 2– Site-Specific Geotechnical/Geologic Considerations,** which demonstrate that the CRT site is a geologically safe and suitable site for the proposed building, and that project construction would not trigger a landslide.
6	The commenter refers to comments given at a scoping meeting and the Draft EIR for the Building 49 project.	The attachments included as part of the comment letter will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project. The scoping comments were all considered in the preparation of this EIR. The attachments relating to the prior project proposed on this site will be part of the record for consideration of this project, but do not specifically relate to the environmental issues relating to this project.	Those comments referred to by the commenter address the CEQA process; as they are not comments on the NEPA document, they are beyond the scope of the EA.

Comment #	Comment Summary	UC EIR Response	DOE Response
7	Commenter submits the report, "Contaminant Plumes of the Lawrence Berkeley National Laboratory and their Interrelation to Faults, Landslides and Streams in Strawberry Canyon, Berkeley and Oakland, California." Commenter requests inclusion of this report and responses to the report in the CRT Final EIR.	The Final EIR will include reproduction of all Draft EIR comments received during the official comment period. Because voluminous appendices and attachments were also submitted by various commenters, the CRT Final EIR may include an accompanying compact disk that holds these large attachments. Hard copies of the attachments as well as the accompanying compact disks will be presented along with all other relevant EIR materials to the UC Regents for their review and consideration of the CRT EIR.	DOE has reviewed the commenter's report. UC LBNL has reviewed the materials in Attachment 7, referred to herein as the commenter's report. The commenter's report includes the assertion that LBNL hill site geologic conditions have been overly simplified by UC LBNL, and that wells monitoring contaminant plumes have not been placed in the right locations along faults, landslides, and old creek beds. The commenter's report concludes that the extent of migration of on-site contaminants will continue to be underestimated. The commenter's report recommends that a conservative approach should be taken by LBNL to resolve these issues. This approach should include, among other things: an outside scientific technical review group to oversee UC LBNL plume monitoring strategy; factors present in the commenter's report that influence groundwater flows should be mapped in a three dimensional model; and, further investigation of faults, geology, and landslides in Strawberry Canyon should be conducted. DOE disagrees with the commenter's report in regard to its characterization of UC LBNL's management and monitoring of on-site conditions. All areas of the LBNL hill site where groundwater and soil contamination is present have been evaluated, the contamination characterized, and remedial systems installed to remediate those conditions as appropriate. UC LBNL has followed a very rigorous State mandated process to investigate and remediate soil and groundwater contamination wherever present. That process involves a detailed analysis of the geology in the area of suspected contamination. The detailed analysis includes investigation for the presence of faults, landslides, bedrock contact surfaces, historic creek beds, or any other condition that would influence the rate and direction of contaminant migration.

Comment #	Comment Summary	UC EIR Response	DOE Response
			Further, the analysis includes development of three-dimensional models to characterize pathways for contaminants that may potentially move under various probable scenarios. This information was also used to determine the location of monitoring wells. The process was performed under the direction and approval of soil and groundwater cleanup experts from DTSC, RWQCB, and City of Berkeley. The results of monitoring are reported to these agencies on an annual basis. If the monitoring results show the need for further evaluation of site conditions, UC LBNL will conduct such an evaluation, with oversight provided by the DTSC, RWQCB, and the City of Berkeley. See **Master Response 1- Geological Conditions Underlying the LBNL Site** for additional information on geological conditions of the LBNL hill site.
8	The commenter refers to a map that compiles fault mapping overlaid with epicenters that have occurred in Strawberry Canyon over the last 40 years. Comment states that there is evidence that additional faults other than the Hayward fault should be considered active.	Section 4.5 of the Draft EIR includes a discussion of seismic risks related to the proposed project's location near the Hayward fault. The Hayward fault is the only active fault in the vicinity of Strawberry Canyon that is recognized by registered Geologists, Geotechnical Engineers and the California Geologic Survey (CGS). The presence of other fault traces within the Berkeley Hills is not relevant to the CRT EIR. None of the secondary fault features on the commenter's referenced figure crosses the CRT site. The Draft EIR recognized that a portion of the CRT site lies within the Alquist-Priolo zone for the Hayward fault (see page 4.5-2), and, as required, a fault trace study of the site was conducted. As stated in the Draft EIR (page 4.5-11), this study found no active fault traces at the project site, and therefore potential impacts due to fault rupture are less than significant.	Please see **Master Response 2 – Site-Specific Geotechnical/Geologic Considerations.** Please also see **subsections 4.2.1** and **5.1, Geology and Soils**, of the EA for a description of faults in the vicinity of the Proposed Action and alternative sites.

Comment #	Comment Summary	UC EIR Response	DOE Response
9	The commenter refers to other maps to supplement supposed inadequacies of the CRT Draft EIR.	Please see **Response to Comment ORG-2-7**, above. The maps attached by the commenter represent conditions of LBNL as a whole, and do not appear to highlight any additional potential impacts of the CRT project that were not already addressed in the Draft EIR. In fact, the figures support statements in the Draft EIR that: (1) the CRT site is located in a landslide prone area (see page 4.5-3); (2) There are no active faults on the CRT site (see page 4.5-11); and (3) the CRT site does not overlie an area of groundwater contamination (see page 4.7-7).	The request to include additional documents is noted. The commenter has not identified specific comments within the documents therefore DOE is unable to respond to the information provided in the documents. Please see **Master Response 1 - Geological Conditions Underlying the LBNL Site,** and **Master Response 2, Site-Specific Geotechnical Considerations.**

Comment #	Comment Summary	UC EIR Response	DOE Response
10	The commenter states that there is possibility that the federal government might close LBNL.	There is no plan for the Department of Energy (DOE) to close Lawrence Berkeley National Laboratory, and the possibility of any such closure at this time is entirely speculative. The current LBNL management contract between the UC Regents and DOE is due to expire on May 31, 2010. The contract includes an award term provision that permits the DOE to extend the contract unilaterally until May 31, 2025. The initial award term extension is for three years and would extend the contract to May 31, 2010; thereafter, extensions are in one-year increments. DOE has advised UC that it has met the performance criteria for the initial three-year extension but is completing some agency internal administrative matters before extending the term of the contract. Future one-year extensions will be determined annually. LBNL is a federally funded research and development center for which DOE has ground leases of UC land independent of the UC management contract and outright ownership of nearly all structures and facilities. The terms of many of the ground leases extend beyond the maximum term of the existing laboratory management contract between DOE and UC. At the conclusion of the current contract DOE will either re-bid the contract or, pursuant to statutory authority, enter into a sole source contract with UC or some other contractor. Regardless, the ground leases will remain. There is a very low likelihood that the DOE would stop funding LBNL. The CRT building will not be located on land currently leased to DOE. A small part of the project site (on which it is anticipated that a footbridge and some mechanical equipment will be located) is on land currently leased to DOE that will be the subject of an anticipated lease-line adjustment. No legacy contamination is known to exist at the CRT project site, which has not previously had a building or other structure located on it.	The CRT building will not be located on land currently leased to the DOE. A small part of the project site (on which it is anticipated that a footbridge and some mechanical equipment will be located) is on land currently leased to the DOE that will be the subject of an anticipated lease-line adjustment. No legacy contamination is known to exist at the CRT project site, The proposed site for the CRT has not had a building or other structure located on it. Comments requesting information about land parcels other than where the CRT would be located are outside the scope of this EA. Speculation about what would happen should the federal government close LBNL is beyond the scope of this EA. The EA does address what would happen at the end of the useful life of the building; see **subsection 1.1, Proposed Action**.

Comment #	Comment Summary	UC EIR Response	DOE Response
11	The commenter asks that the NERSC Center stay in Oakland and that the Richmond Field Station site be considered for all future UC and non-DOE funded future projects to mitigate traffic and diesel exhaust impacts.	As stated in the comment, the proposed CRT project, together with other planned future development, would result in significant impacts on traffic and transportation. The Draft EIR identifies impacts and proposed improvements to mitigate these impacts to less than significant levels or lessen the magnitude of impacts. These mitigation measures range from physical improvements such as installation of new signals to enhancing the existing Transportation Demand Management (TDM) program at LBNL that would increase the number of employees and visitors who would not drive their vehicles to the site. The comment and the opinions of the commenter will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.	Please see **Master Response 5 – Purpose and Need of the Proposed Action and Alternatives.** **Subsection 5.7** of the EA compares air quality impacts due to traffic for several alternatives, including the Proposed Action and the Richmond Field Station sites. **Subsection 5.10** of the EA compares traffic impacts for these alternatives.
12	The commenter requests that more development not be undertaken in the Strawberry Canyon watershed. Comment requests planning to save maximum amount of students and Berkeley residents when Hayward fault ruptures.	The commenter's assessment of the Strawberry Creek watershed area is noted. The proposed CRT project is consistent with development anticipated and analyzed in the Lab's 2006 Long Range Development Plan EIR as well as in the analysis undertaken in the CRT EIR.	Comment with respect to wanting no more development in the Strawberry Creek watershed is noted. LBNL has an extensive emergency response and contingency plan (**subsection 5.3, Hazards, Human Health, and Accidents)** to address potential problems that could result in the event that there is fault rupture along the section of the Hayward fault near the LBNL site.
13	The commenter claims that public concerns (expressed during scoping period for the Draft EIR) were not adequately taken into consideration in the CRT Draft EIR.	Please see **Response to Comment ORG-2-7**, above regarding the inclusion of attachments. The public scoping process for the CRT Draft EIR is discussed in Section 1.0, Introduction (page 1.0-5). Any scoping comments received on environmental topics to be covered in the Draft EIR are summarized at the beginning of each relevant topical section and are addressed in the analysis contained within that section.	Those comments referred to by the commenter were addressed as part of the CEQA process; as they are not comments on the NEPA document, they are beyond the scope of the EA.

Comment #	Comment Summary	UC EIR Response	DOE Response
Letter from Laurie Brown and Jonathon Fernandez on the CRT Draft EIR			
14	Commenter questions the need for a "computer storage facility" at the Proposed Action site and finds that LBNL should consider other sites in West Berkeley and the East Bay in general. Comment questions need for physical proximity among the researchers, and suggests use of teleconferencing and desktop sharing services.	As discussed in the CRT Draft EIR, the CRT facility would not be simply a "computer storage facility" but an "integrated and appropriately designed facility that would allow for the continued operation and future advancement of the Berkeley Lab's NERSC High Performing Computing national users facility, Computational Research Division and joint Berkeley Lab/UC Berkeley Computational Science & Engineering programs." It would integrate office and meeting space with the computing infrastructure, and put this facility in close proximity to reliable and adequate power sources and other LBNL facilities, researchers, and amenities. With regard to the need for proximity, see **Master Response No. 1, Alternative Site – Richmond Field Station**.	See **Master Response 5 – Purpose and Need of the Proposed Action and Alternatives.** The purpose and need for the Proposed Action is also discussed in **Section 2.0, Purpose and Need,** in the EA.

Comment #	Comment Summary	UC EIR Response	DOE Response
15	Comment suggests that the Proposed Action is a "computer storage facility" and is concerned with emergency access in the event of an earthquake, wildfire, flood.	As discussed in the CRT Draft EIR, the CRT facility would not be simply a "computer storage facility" but an "integrated and appropriately designed facility that would allow for the continued operation and future advancement of the Berkeley Lab's NERSC High Performing Computing national users facility, Computational Research Division and joint Berkeley Lab/UC Berkeley Computational Science & Engineering programs." It would integrate office and meeting space with the computing infrastructure, and put this facility in close proximity to reliable and adequate power sources and other LBNL facilities, researchers, and amenities. In response to the commenters' suggestion that the project should be located elsewhere, please see **Master Response No. 1, Alternative Site – Richmond Field Station**. In addition to the two-lane Cyclotron Road mentioned in the comment, the LBNL Campus, including the proposed CRT site, is also served by the Strawberry Canyon and Grizzly Peak gates that are accessed from Centennial Drive. As stated in the comment, the Draft EIR has identified impacts and proposed potential improvements to mitigate these impacts to less than significance levels or lessen the magnitude of impacts.	See **Master Response 5 – Purpose and Need of the Proposed Action and Alternatives** for a discussion of alternative addressed in the EA. Fire hazards, and emergency response, including evacuation routes, are described in **subsection 5.3, Hazards, Human Health, and Accidents**. Please also see **Master Response 2 – - Site-Specific Geotechnical/Geologic Considerations** and **Master Response 7 – Risk of Wildland Fire at the CRT Site.**

Comment #	Comment Summary	UC EIR Response	DOE Response
16	The commenter questions the reasons behind evaluating off-site alternative locations in the EIR. Commenter also questions project objectives under CEQA that require physical proximity of researchers.	With regard to the need for proximity, see **Master Response No. 1, Alternative Site – Richmond Field Station**.	The EA does compare a number of off-site locations. See **Section 1.0** of the EA for a summary of impacts of the Proposed Action and the alternatives. See also **Master Response 5 – Purpose and Need of the Proposed Action and Alternatives** for a discussion of alternatives addressed in the EA. **Section 2.0, Purpose and Need,** includes a discussion about the need for proximity of researchers.
17	Commenter is concerned about availability of utility infrastructure at the Proposed Action site, including availability of power in the event of outages, wildfire vulnerabilities, and water delivery. Comment is also concerned with on-site cogeneration of power.	Section 4.6, Hazards and Hazardous Materials identifies the emergency response plan for the CRT project. In the event of an emergency on the project site, including a wildland fire, earthquake or landslide, the Berkeley Lab would implement the Master Emergency Program Plan (MEPP), which establishes policies, procedures, and an organizational structure for responding to and recovering from a major disaster at the Berkeley. The emergency evacuation plan for the Lab includes provisions for vehicular and pedestrian evacuation, in various scenarios where vehicular access to the site may be limited (see Section 4.6, Hazards and Hazardous Materials).	**Subsection 3.1.6, Utilities and Infrastructure** in the EA discusses the utilities and infrastructure proposed for the Proposed Action site. The environmental effects associated with utilities are addressed in **subsection 5.11, Utilities and Waste Management.** Fire hazards, and emergency response, including evacuation routes, are described in **subsection 5.3, Hazards, Human Health, and Accidents**. Cogeneration was an optional component of the proposed project analyzed in the EIR. This component is no longer included in the Proposed Action. Also, see **Master Response 4- Gas Main Risk at CRT Site.**

Comment #	Comment Summary	UC EIR Response	DOE Response
17 (cont.)		The Lab is concerned with the ability of the utility infrastructure to withstand natural disasters. Water and gas lines on the project site would be subject to design review by the East Bay Municipal Utility District (EBMUD) and Pacific Gas & Electric Company (PG&E) prior to project construction, which would minimize the vulnerability of these lines to rupture in the event of an earthquake. Current building code standards generally include requirements for flexible joints and connections to reduce the risk of rupture. The Draft EIR found less than significant impacts associated with water demands and energy requirements for the proposed project and found that project-level mitigation would not be required (see Section 4.13, Utilities, Service Systems, and Energy.) In addition, the utility lines outside the Lab management boundary (such as EBMUD for water, PG&E for natural gas transport and electricity, and the City of Berkeley for sanitary sewer and storm drains) could be degraded in the event of an earthquake or other natural disaster. The Lab would obtain confirmation of the integrity of utility lines from the respective utilities in order to continue operation following a major disaster. It would be speculative to analyze provisions for these services to the project site in the event of a natural disaster, in comparison to other sites in the area. No further analysis is required.	

Comment #	Comment Summary	UC EIR Response	DOE Response
18	The comment discusses Table 5.0-4 in the EIR. Commenter is concerned with cumulative impacts, especially with respect to traffic.	As stated in the comment, the Draft EIR identifies the project's impacts at a number of study intersections as significant and unavoidable under Cumulative conditions (pages 5.0-30 through 5.0-34). These intersections would operate at an unacceptable LOS E or LOS F regardless of the proposed CRT project and the proposed project (by itself or combined with Helios) would increase total intersection volumes by less than five percent. Although the significance criteria for the Draft EIR require that a project increase total intersection volumes at an intersection already operating at an unacceptable LOS E or LOS F by more than five percent, this Draft EIR conservatively concluded that the project's contribution to these intersection impacts would be significant and requires the implementation of LRDP Mitigation Measures TRANS-1a through 1d (page 5.0-32). These mitigation measures require LBNL to contribute fair share of the cost for potential improvements and to implement an enhanced Transportation Demand Management (TDM) program.	The comment regarding the table in the EIR is noted. With respect to the EA, cumulative effects of the Proposed Action are evaluated in **Section 6.0, Cumulative Effects**. Cumulative traffic effects are described in **subsection 6.2.10, Transportation and Traffic.**
19	The commenter requests consideration of off-site alternatives and suggests that a construction cost comparison of those sites and the proposed action be included in the EA.	Alternative project locations are discussed in Section 6.0, Alternatives. CEQA does not require analysis or comparison of project financial feasibility. In general, the comment expressed the opinion of the commenter. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.	The EA evaluates environmental effects from developing the CRT facility at several alternative sites that are described in **subsection 3.2, Alternatives to the Proposed Action.** The environmental effects of the Proposed Action and alternatives are evaluated in the EA. The comment with respect to financial resources is noted.

Comment #	Comment Summary	UC EIR Response	DOE Response
20	Comment is concerned with protecting visual resources, special historic, cultural resources and wildlife habitat at the Proposed Action site.	The setting in which the project is proposed is neither wilderness nor public open space. The site is located within the larger context of an existing federally managed laboratory campus with limited public access. While mature stands of trees appear between structures, historically before European settlement, the hillside was covered in grasslands with tree cover only in riparian areas. Existing vegetation on site is predominantly introduced eucalyptus species. However, rather than return the hillside to pre-settlement patterns, the LBNL LRDP seeks to maintain the heavily vegetated appearance of the campus, and a one-to-one replacement of trees removed is required. With regard to the presence of a cultural landscape, please see **Master Response No. 3, Strawberry Canyon Cultural Landscape Claims**.	The affected environment and environmental consequences of the Proposed Action are described in the EA. Biological resources are evaluated in **subsections 4.2.4** and **5.4, Biological Resources**, are evaluated in **subsections 4.2.5** and **5.5**, and visual resources are evaluated in **subsections 4.2.6** and **5.6**. In addition, DOE has completed an informal consultation with the USFWS and found that there is no potential for adverse effect on whipsnakes. See also **Master Response 6 – Visual Quality of the Proposed Action Site**
21	Comment is concerned with environmental effects of the Proposed Action and cumulative development on rare, sensitive, threatened or candidate species. Comment is also concerned with the Helios project.	The biological impacts associated with the project's footprint were evaluated in Section 4.3, Biological Resources. As noted in the LRDP Principles and Strategies in the section, the Lab seeks to "Preserve and enhance the environmental qualities of the site as a model of resource conservation and environmental stewardship." The project would comply with applicable Department of Fish and Game Code, in addition to all other federal, state and local regulations and policies meant to reduce potential impacts to wildlife.	As discussed in **subsection 5.4, Biological Resources**, the Proposed Action has incorporated LBNL SPFs that would prevent the incidental taking of the Alameda whipsnake and would prevent effects on active maternity bat roosts. In addition, DOE has completed an informal consultation with the USFWS and found that there is no potential for adverse effect on whipsnakes. As discussed in **subsection 6.2.4, Biological Resources,** these SPFs would be incorporated in all LBNL projects, and best management practices would be incorporated in UC Berkeley projects, which would minimize cumulative impacts on sensitive biological resources. The Helios project is beyond the scope of the EA.

Comment #	Comment Summary	UC EIR Response	DOE Response
21 (cont.)		As discussed in the Draft EIR (4.3-13 to 4.3-14), no special-status plant species are expected to occur on the project site. While the project site is located adjacent to existing development and is dominated by non-native plant species, there is some potential that on-site habitats could provide nesting habitat for raptors and other special-status species. The implementation of the avoidance and mitigation measures incorporated into the Draft EIR would prevent the direct loss of any special-status wildlife. Additionally, the Draft EIR (page 4.3-3) concludes that the loss of wildlife habitat (including trees and other vegetation) from project implementation would be less than significant. This conclusion is supported by the fact that the habitat types to be impacted by the project are abundant in the project region. Eucalyptus groves and non-native grasslands are abundant on LBNL and surrounding areas, including areas that are accessible to any displaced wildlife. Therefore, given that the direct loss of special-status species would be avoided through incorporated measures and that similar habitat would still occur in abundance in surrounding and accessible areas, the project-related habitat loss does not meet any of the Significance Criteria defined in the Draft EIR (see page 4.3-21). The required replacement of all trees to be removed would further minimize the small habitat loss associated with the proposed project. The remainder of the comment appears to address the proposed Helios project and is not a comment on the CRT Draft EIR. The CRT project is not a component of the Helios project and would not include any Helios program functions. In general, the comment expressed the opinion of the commenter. The comment will be included as part of the record and made available to the decision makers prior to a final decision on the proposed project.	

Comment #	Comment Summary	UC EIR Response	DOE Response
22	Comment is concerned with the exhaust system and potential effects on birds and bats, and the increased night lighting and its effects on nocturnal birds.	The proposed CRT Facility would be constructed adjacent to existing buildings on the LBNL campus. While the larger trees on the project site do provide potential raptor nesting habitat, the potential use of these trees by raptors is already limited by the proximity of existing development and associated uses. Therefore, the construction of an additional building adjacent to existing developed uses, as well as the introduction of a new noise source would not substantially worsen an already compromised condition for raptors and other wildlife. The air intakes would be screened to prevent entry by birds and other animals. In regards to lighting, the proposed project has been designed not to include light spillage into the open space located to the south of the project site or other nearby sensitive habitats.	The proposed CRT Facility would be constructed adjacent to existing buildings on the LBNL site. While the larger trees on the project site do provide potential raptor nesting habitat, the potential use of these trees by raptors is already limited by the proximity of existing development and associated uses. Therefore, the construction of an additional building adjacent to existing developed uses, as well as the introduction of a new noise source would not substantially worsen an already compromised condition for raptors and other wildlife. The air intakes would be screened to prevent entry by birds and other animals. In regards to lighting, the proposed project has been designed to avoid light spillage into the open space located to the south of the project site or other nearby sensitive habitats. Biological resources at the Proposed Action site are discussed in **subsections 4.2.4** and **5.4**, **Biological Resources.**

Comment #	Comment Summary	UC EIR Response	DOE Response
23	The comment addresses a statement in the EIR about Alameda whipsnake. The comment is concerned with the proximity of the coastal scrub habitat to the Proposed Action site.	As discussed in the Draft EIR (4.3-6), coastal scrub habitat occurs approximately 25 feet to the south of the project site. This coastal scrub area is and would continue to be separated from the project site by a fence and steep slopes. These features prevent human entry from the project site to the area of coastal scrub habitat in question. Additionally, the area of coastal scrub habitat is currently located near developed uses, including Cyclotron Road, paved parking areas, and buildings. There are also cooling towers on a neighboring building. Therefore, the proposed project would not substantially increase the level of development (and associated noise) near the coastal scrub habitat. Following development of the project site, it would be considered highly unlikely that Alameda whipsnake would move onto the project site given the absence of suitable habitat. Further, given the degree of development and the absence of accessible coastal scrub habitat to the north, east, and west of the project site, it is not expected that Alameda whipsnake would disperse across the project site.	As stated in **subsection 5.4**, **Biological Resources,** Alameda whipsnake habitat includes coastal scrub vegetation and open space grasslands, which occurs along south-facing slopes to the south of the Proposed Action site, outside of the project boundary. Environmental effects associated with the Alameda whipsnake are discussed in **subsection 5.4, Biological Resources.** In addition, DOE has completed an informal consultation with the USFWS and found that there is no potential for adverse effect on whipsnakes.
24	Comment asserts that the project purpose statement is incorrect and that the EIR has not demonstrated that the project cannot be constructed at another environmentally less damaging site.	The Lab disagrees with the commenter's assertion that the project objectives make the site under consideration a defined purpose of the project itself. The objectives do not reference any particular site, but they do appropriately reference such factors as the importance of convenient access by researchers and access to a large and reliable source of electric power. Please see **Master Response No. 1, Alternative Site – Richmond Field Station**.	See **Master Response 5 – Purpose and Need of the Proposed Action and Alternatives.** The adequacy of the EIR, however, is beyond the scope of the EA.

Public Agency Comments

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT
SINCE 1955

October 15, 2010

Kim Abbott
Department of Energy
Office of Science
Berkeley Site Office
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS 90-1023
Berkeley, CA 94720

Subject: Draft Environmental Assessment for Computational Research and Theory Facility Project

Dear Mr. Abbott:

Bay Area Air Quality Management District (District) staff reviewed the Department of Energy's (DOE) Draft Environmental Assessment (EA) for the Computational Research and Theory Facility Project (Project). Staff understands that the DOE has already completed CEQA review for this Project and is now completing documents for NEPA review. The Project would relocate and expand existing Lawrence Berkeley National Laboratory (LBNL) activities to a facility on or near the LBNL site. The Project would entail the construction of a 140,000 square foot building or the renovation of an existing building.

The EA determined that there would be no potential significant impacts, including no impacts due to greenhouse gas (GHG) emissions, from the Project. This determination was not based on BAAQMD thresholds because the Project analysis began before the BAAQMD Board of Directors adopted these thresholds on June 2, 2010.

BAAQMD staff understands that the DOE intends to require the Project to meet LEED Gold standards, implement an employee transportation demand management program and to procure energy from energy sources that exclude coal through the Western Area Power Administration (WAPA). However, the Project will still have a large energy demand and associated GHG emissions.

Staff urges the DOE to commit to all possible steps to minimize these impacts. In order to further reduce the Project's GHG emissions, staff recommends that DOE commit to the following additional measures as a condition of Project approval:

- Adding on-site renewable energy sources, such as wind, solar panels, or other alternative energy technology, and committing to powering a specific percentage of the Project with this renewable energy source.
- Meeting LEED Platinum green building standards.
- Employing the most energy-efficient computer servers, and using server consolidation and virtualization as possible.

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Please contact BAAQMD's engineering staff to determine if any permits are needed for potential new stationary source equipment at 415-749-4990 or http://www.baaqmd.gov/Divisions/Engineering/Application-Forms.aspx.

District staff is available to assist DOE staff in addressing these comments. If you have any questions, please contact Alison Kirk, Senior Environmental Planner, at (415) 749-5169.

Sincerely,

Jean Roggenkamp
Deputy Air Pollution Control Officer

cc: BAAQMD Vice-Chairperson Tom Bates
BAAQMD Director Scott Haggerty
BAAQMD Director Jennifer Hosterman
BAAQMD Director Nate Miley

REC'D OCT 15 2010

EAST BAY
MUNICIPAL UTILITY DISTRICT

October 13, 2010

Kim Abbott, NEPA Document Manager
Department of Energy, Berkeley Site Office
Lawrence Berkeley National Laboratory
One Cyclotron Road, MS 90-1023
Berkeley, CA 94720

Re: Notice of Availability of a Draft Environmental Assessment for the Computational Research and Theory Facility Project, Lawrence Berkeley National Laboratory

Dear Mr. Abbott:

East Bay Municipal Utility District (EBMUD) appreciates the opportunity to comment on the Draft Environmental Assessment for the Computational Research and Theory Facility Project located at the Lawrence Berkeley National Laboratory (LBNL) in the Oakland/Berkeley Hills. EBMUD's written comments to the Notice of Preparation of an EA dated January 13, 2010 (see enclosure) still apply.

If you have any questions concerning this response, please contact David J. Rehnstrom, Senior Civil Engineer, at (510) 287-1365.

Sincerely,

David J Rehnstrom

FOR William R. Kirkpatrick
Manager of Water Distribution Planning Division

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Enclosure

375 ELEVENTH STREET . OAKLAND . CA 94607-4240 . TOLL FREE 1-866-40-EBMUD

EAST BAY
MUNICIPAL UTILITY DISTRICT

January 13, 2010

Kim Abbott, NEPA Document Manager
Department of Energy, Berkeley Site Office
Lawrence Berkeley National Laboratory
One Cyclotron Road, MS 90-1023
Berkeley, CA 94720

Re: Notice of Preparation of a National Environmental Policy Act Environmental Assessment for the Computational Research and Theory Facility Project, Lawrence Berkeley National Laboratory

Dear Mr. Abbott:

East Bay Municipal Utility District (EBMUD) appreciates the opportunity to comment on the Notice of Preparation of a National Environmental Policy Act (NEPA) Environmental Assessment for the Computational Research and Theory (CRT) Facility Project located at the Lawrence Berkeley National Laboratory (LBNL) in the Oakland/Berkeley Hills. EBMUD provided written comments to LBNL on the Draft Environmental Impact Report (EIR) for the CRT Facility Project under the California Environmental Quality Act (CEQA) on January 3, 2008 (see enclosure) and understands that the project is now in the NEPA process. EBMUD has the following comments.

GENERAL

The Notice of Preparation states that the Department of Energy has a need to move the CRT Facility Project from its present downtown Oakland location to LBNL or other unidentified alternative site(s). EBMUD's comments on the Draft EIR for the CRT Facility Project were incorporated into the Final EIR under CEQA; these still apply and should be incorporated into the NEPA Environmental Assessment.

WASTEWATER

EBMUD's Main Wastewater Treatment Plant (MWWTP) and interceptor system are anticipated to have adequate dry weather capacity to treat the proposed wastewater flows from this project, provided that the wastewater meets the requirements of the current EBMUD Wastewater Control Ordinance. However, wet weather flows are a concern. EBMUD has historically operated three Wet Weather Facilities to provide treatment for high wet weather flows that exceed the treatment capacity of the MWWTP. On

January 14, 2009, due to Environmental Protection Agency's and the State Water Resources Control Board's (SWRCB) re-interpretation of applicable law, the Regional Water Quality Control Board (RWQCB) issued an order prohibiting further discharges from EBMUD's Wet Weather Facilities. Additionally, on July 22, 2009 a Stipulated Order for Preliminary Relief issued by Environmental Protection Agency, the SWRCB, and RWQCB became effective. This order requires EBMUD to begin work that will identify problem inflow/infiltration areas, begin to reduce inflow/infiltration through private sewer lateral improvements, and lay the groundwork for future efforts to eliminate discharges from the Wet Weather Facilities.

Currently, there is insufficient information to forecast how these changes will impact allowable wet weather flows in the individual collection system subbasins contributing to the EBMUD wastewater system, including the subbasin in which the proposed project is located. As required by the Stipulated Order, EBMUD is conducting extensive flow monitoring and hydraulic modeling to determine the level of flow reductions that will be needed in order to comply with the new zero-discharge requirement at the Wet Weather Facilities. It is reasonable to assume that a new regional wet weather flow allocation process may occur in the East Bay, but the schedule for implementation of any new flow allocations has not yet been determined. In the mean time, it would be prudent for the lead agency to require the project applicant to incorporate the following measures into the proposed project: (1) replace or rehabilitate any existing sanitary sewer collection systems to reduce inflow/infiltration and (2) ensure any new wastewater collection systems for the project are constructed to prevent inflow/infiltration to the maximum extent feasible. Please include such provisions in the environmental documentation for this project.

If you have any questions concerning this response, please contact David J. Rehnstrom, Senior Civil Engineer, at (510) 287-1365.

Sincerely,

Haley P. Ham for

William R. Kirkpatrick
Manager of Water Distribution Planning Division

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Enclosure

EAST BAY
MUNICIPAL UTILITY DISTRICT

January 3, 2008

Jeff Philliber, Environmental Planner
Lawrence Berkeley National Laboratory
Environmental Planning Group
One Cyclotron Road, MS 90J0120
Berkeley, CA 94720

Re: Draft Environmental Impact Report for the Computational Research and Theory Facility, Lawrence Berkeley National Laboratory

Dear Mr. Philliber:

East Bay Municipal Utility District (EBMUD) appreciates the opportunity to comment on the Draft Environmental Impact Report (EIR) for the Computational Research and Theory (CRT) Facility located at the Lawrence Berkeley National Laboratory (LBNL) in the Oakland/Berkeley Hills. EBMUD has the following comments.

WATER SERVICE

EBMUD's Shasta and Berkeley View Pressure Zones currently serve the existing LBNL facilities. If additional water service is needed, the project sponsor should contact EBMUD's New Business Office and request a water service estimate to determine costs and conditions for providing additional water service to the existing parcels. Engineering and installation of water services requires substantial lead-time, which should be provided for in the project sponsor's development schedule.

WATER RECYCLING

EBMUD recommends adding the following discussion regarding Water Recycling in Section 4.13 -- Utilities, Service Systems, and Energy of the EIR:

EBMUD's Policy 8.01 requires that customers use non-potable water for non-domestic purposes when it is of adequate quality and quantity, available at reasonable cost, not detrimental to public health and not injurious to plant life, fish and wildlife to offset demand on EBMUD's limited potable water supply. Based on the Draft EIR, the CRT facility would require approximately 29.3 million gallons per year, or

80,300 gallons per day (gpd) at buildout for potable and cooling water. The proposed project would generate wastewater from restrooms and cooling tower blowdown. The combined wastewater source would generate on average approximately 6,000 gpd, with up to 21,000 gpd during peak periods, at buildout. Depending on the irrigation demands at the project site, the CRT facility could be a potential candidate for recycled water through a satellite treatment system. The combined wastewater source could be treated through a satellite treatment system to be located in the vicinity of the CRT facility to meet irrigation demands, thereby offsetting demands for potable and cooling water. EBMUD recommends that LBNL coordinate the development of this project closely with EBMUD to determine the feasibility of providing recycled water to the project area.

WATER CONSERVATION

EBMUD recommends adding the following discussion regarding Water Conservation in Section 4.13 -- Utilities, Service Systems, and Energy of the EIR:

The proposed project presents an opportunity to incorporate water conservation measures. EBMUD would request that LBNL include requirements for the project to incorporate WaterSmart technology and design standards in the landscape and building design. At a minimum the landscape design should be designed to a water budget as described in the State Model Water Efficient Landscape Ordinance in Division 2, Title 23, California Code of Regulations, Chapter 2.7, sections 490 through 495. Provisions should be established to monitor the water budget for compliance after project completion. EBMUD reviews applications for new standard water services and applications for expanded service for compliance with EBMUD Water Service Regulation Section 31, Water Efficiency Requirements. Although the Draft EIR indicates that no new or expanded water service connections would be needed to serve the project, implementation of Section 31 water efficiency requirements for nonresidential service is recommended. Section 31 requirements identify specifications for toilets, urinals, showerheads, lavatory and kitchen faucets, cooling towers, commercial refrigeration, outdoor landscaping and irrigation. EBMUD recommends that LBNL coordinate the development of this project closely with EBMUD to incorporate the most water efficient appliances and fixtures practical, even if not specifically noted in Section 31. Note that some of EBMUD's Section 31 requirements exceed the Uniform Plumbing Code requirements. EBMUD staff would appreciate the opportunity to meet with applicant's staff. A key objective of this discussion will be to explore timely opportunities to expand water conservation via early consideration of EBMUD's conservation programs and best management practices applicable to the project.

If you have any questions concerning this response, please contact David J. Rehnstrom, Senior Civil Engineer, at (510) 287-1365.

Sincerely,

William R. Kirkpatrick
Manager of Water Distribution Planning Division

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APPENDIX 5

US Fish and Wildlife Consultation

Department of Energy
Office of Science
Berkeley Site Office
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS 90-1023
Berkeley, California 94720

JAN 21 2011

VIA EMAIL

Ryan Olah
U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office
Coast Bay Region
2800 Cottage Way W-2605
Sacramento, CA 95825

Subject: Section 7 Informal Consultation for the Construction of the Computational Research and Theory (CRT) Facility at the Lawrence Berkeley National Laboratory (LBNL)

References: Draft Environmental Assessment (DOE/EA 1700) Computational Research and Theory Facility Project

Dear Mr. Olah:

The U.S. Department of Energy Department of Energy (DOE) requests your concurrence with our determination that the subject action (construction of the CRT) may affect, but is not likely to adversely affect the threatened Alameda whipsnake (*Masticophis lateralis euryxanthus*) or its critical habitat. Our determination was based on extensive studies of the whipsnake on LBNL and the action area study enclosed.

On September 14, 2010, the DOE sent for review and comment by the United States Fish and Wildlife Service (USFWS) the National Environmental Policy Act draft EA referenced above regarding the proposed construction and operation of the CRT Facility. Section 5.4 of the draft EA includes analysis of potential impacts to the Alameda whipsnake, a federally-listed "threatened" species. The construction activities associated with the proposed action would begin in early 2011 and be completed by late 2013. The facility would be constructed on a 2.25 acre site situated between two densely developed building complexes to the east, the LBNL's main roadway to the west and north, and an area of undeveloped "perimeter open space" to the south above UC Berkeley's Memorial Stadium. The new three-story building would consist of an approximately 3,000-gross-square-meter (32,000-gross-square-foot) computing floor with a high ceiling and two additional floors of office space for a total of approximately 12,980-gross-square-meters of space. All of the haul routes are on existing paved roads. There will be no off-road vehicle use other than on the project site.

The following information below and the enclosed provide the best information available for assessing the risks posed to the Alameda whipsnake in accordance with 50 CFR 402; 16 U.S.C. 1536 (c), the regulations implementing Section 7 of the Endangered Species Act.

- The site, which is predominantly vegetated with eucalyptus and non-native grassland, does not contain core habitat or features characteristic for optimal Alameda whipsnake habitation.
- The site is disturbed, highly constricted, and surrounded on two of three sides by busy roadways and development; it does not serve as a habitat corridor for the Alameda whipsnake because habitat only occurs on one side.
- Although numerous biological surveys have taken place on the relatively small CRT site, no evidence of Alameda whipsnake habitation or presence has ever been noted there. In fact, no Alameda whipsnakes have ever been reported in the area of the project during several decades of annual vegetation management on that site.
- The proposed project would employ a rigorous set of preventative construction practices specifically designed to avoid incidental taking of the Alameda whipsnake. These are known as "Standard Project Features," or "SPFs."
- The "SPFs" were designed in past informal consultation with USFWS; with Karen Swaim who is USFWS' consulting biological expert on Alameda whipsnakes; and with other professional consulting biologists. LBNL has formally committed to following these SPFs for projects such as this.
- Project construction SPF's concerning the Alameda whipsnake include:
    - Alameda whipsnake identification and awareness training provided for all construction personnel; establishment of official site monitors prior to construction;
    - "Stop work" and USFWS-approved relocation protocols established prior to construction commencement;
    - Vegetation management (grass and brush removal) prior to project commencement and maintained throughout construction;
    - Implementation of pre-construction surveys and snake fencing, as appropriate;
    - Hours of operations, project lighting, and off-road speed limits shall be established;
    - Full time designated monitoring and daily site surveys prior to daily work commencement.
- Studies (enclosure [1]) which most recently examined this site in connection with the CRT EA (competed in June 2007) support a conclusion that this project would not adversely affect the Alameda whipsnake.

There has been only one documented occurrence of the Alameda whipsnake at the 202-acre LBNL site in its 70-year history. That occurrence was reported at the far southeastern corner of the Lab hill site, approximately two-thirds of a mile from and in very different habitat than presented by the proposed CRT site. Prior to the single occurrence at the LBNL site, the DOE and the LBNL facility have worked diligently to ensure the species' protection at the LBNL site. In fact, this effort to monitor for the possible presence of whipsnakes and to ensure their protection began at LBNL in the mid-1990s, prior to the species' initial listing by the USFWS in 1997. The DOE and University of California have commissioned several studies over the past two decades to continually seek evidence of the species' presence on the LBNL site and to understand how best to avoid incidental takings. We have worked closely with whipsnake expert biologist Karen Swaim, other consulting biologists, and the USFWS in the past to ensure that that we employ construction practices that would not adversely affect this species.

A copy of the draft EA can be found at http://www.lbl.gov/Community/CRT/index.html and a site specific study is enclosed. Additional studies and information are provided as enclosures or will be provided upon request. We will also provide USFWS with background studies and information during your upcoming site visit to LBNL, expected to occur on January 25, 2011.

We appreciate your time and attention in this matter and would further appreciate any efforts the USFWS could make in helping to expedite this process, as we are approaching deadlines for the completion of the NEPA process.

If you have any questions please contact the undersigned at (510) 486-7909 or email kim.abbott@bso.science.doe.gov.

Sincerely,

K. Abbott

Kim Abbott
Environmental Program Manager

Enclosures:
(1) Site Specific Study for the Construction of the CRT
(2) Swaim 2006 Report
(3) LBNL 2006 Long Range Development Plan Environmental Impact Report July 2007

cc (w/encl.):
F. Gardipee, FWS
J. Philliber, LBNL

Site Specific Alameda Whipsnake Study

Alameda whipsnake (*Masticophis lateralis euryxanthus*) is listed as threatened under both federal and state law and is generally found in open-canopied shrub communities, including coastal scrub and chaparral, and adjacent habitats including oak woodland/savanna and grassland areas (Swaim 1994). Recent surveys and studies have shown that Alameda whipsnake can be found in a wider variety of habitats than previously thought. For example, whipsnakes have been found in grasslands with very little scrub present, in coastal scrub with dense canopy cover, and in patches of scrub less than 0.5 acre in size (Swaim 2003). Therefore, habitat associations for this subspecies should include those that co-occur in the general chaparral/scrub habitat mosaic (Alvarez 2005). These recent findings suggest the possibility that whipsnakes could inhabit, or disperse through, areas of the LBNL site where coastal scrub habitat occurs in a mosaic with other habitat types such as grassland or woodland. Though habitat types and features used by Alameda whipsnakes may vary, home ranges typically are centered on areas of scrub habitats with open to partially open canopy, on south-, southeast-, east-, and southwest-facing slopes. Rock outcrops are important for protection from predators and as habitat for western fence lizards and other prey species (Swaim 1994).

A recent whipsnake habitat assessment of LBNL (Swaim 2006) found that potential whipsnake occurrence would be most likely in the easternmost portion LBNL that is contiguous with open space to the north and east and along the south-facing slopes of Strawberry Canyon. These areas are primarily open space with a mosaic of grassland, coastal scrub, riparian woodland, and stands of non-native trees and provide a potential dispersal corridor from designated critical habitat for the species (USFWS 2006) to areas of potential suitability for the whipsnake. The 2006 LBNL habitat assessment identified and mapped potential for Alameda whipsnake occurrence based on habitat types present and other factors, including habitat fragmentation and existing land uses. Areas designated as having “highly suitable potential habitat” for whipsnake (which include the CRT project site) were those that included relatively large patches of coastal scrub in a mosaic of other habitat types and that were contiguous with larger open space areas and known occupied habitat and/or proposed critical habitat (Swaim 2006; McGinnis 1996). Areas designated as having “potential habitat” were those that contained smaller patches of scrub in a mosaic with other habitat types but where there was also a fairly significant degree of fragmentation and habitat degradation and a lesser degree of contiguity with larger areas of less disturbed potential habitat.

After conducting site visits during the summer of 2000, the USFWS determined that most of the LBNL site, including areas with existing facilities, should be excluded from its final critical habitat listing (USFWS 2000)[1]. The 2000 designation of critical habitat was rescinded in 2003 but a new critical habitat designation was proposed in 2005 and adopted in October 2006 that, similar to the 2000 designation,

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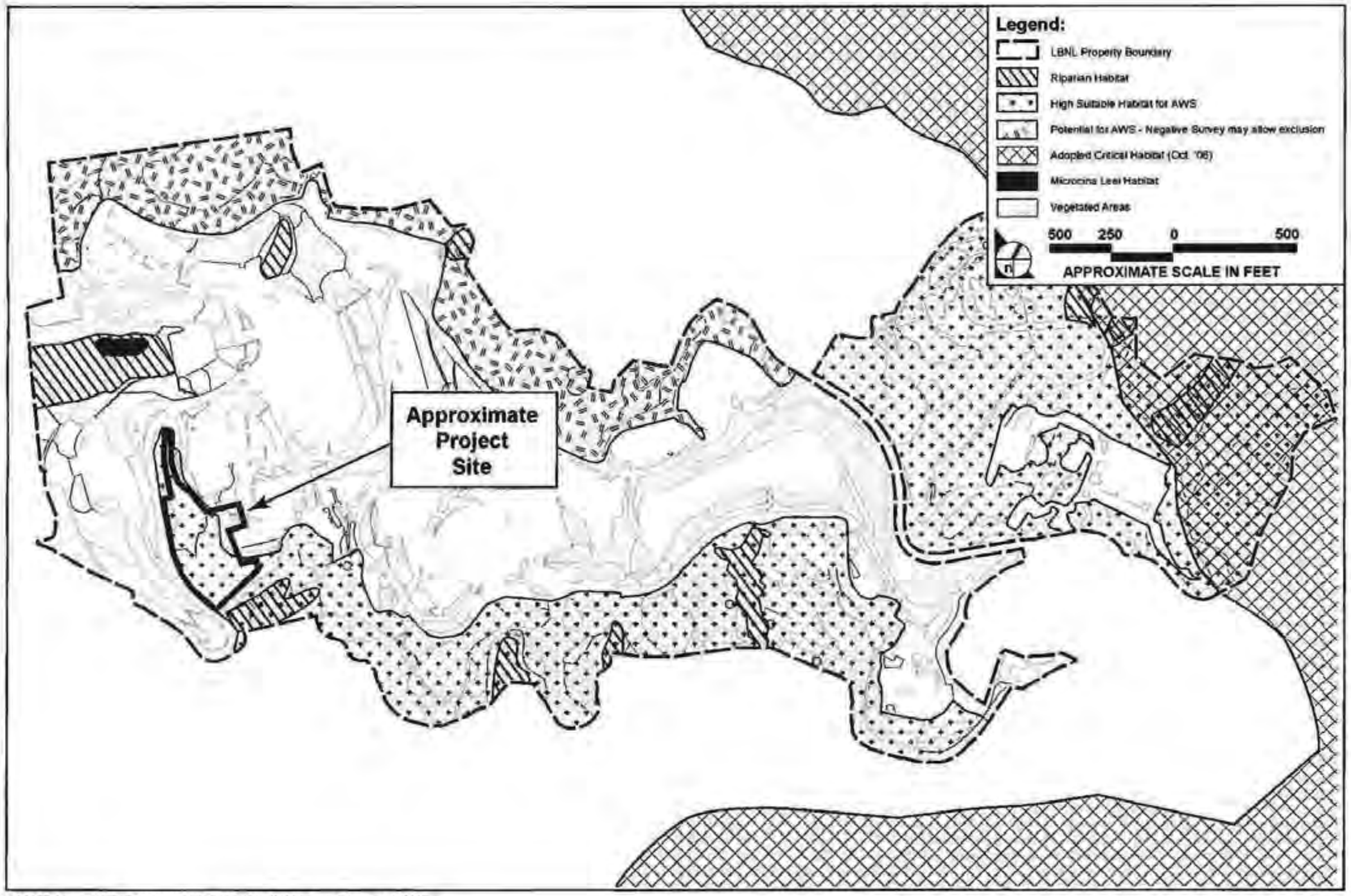
[1] Critical habitat for the Alameda whipsnake was rescinded by court order on May 9, 2003. For the purposes of this analysis, the concept is still relevant in that the designation of critical habitat implies a high likelihood of species’ presence where critical habitat elements are found. Even though critical habitat has been rescinded, the species is still fully protected under the FESA. In addition, the USFWS (2002) published a draft recovery plan that includes the species, and areas that were formerly designated as critical habitat units are now designated as recovery units under the plan. Finally, critical habitat for the species was re-proposed in October 2005 (USFWS 2005d) and, as adopted in October 2006 (USFWS 2006), includes the easternmost portion of the Lab site.

includes the easternmost portion of the LBNL site[2]. This area is designated as a fixed constraint under the 2006 LRDP. Since it is a protected area, no development is proposed or allowed.

The project site is within an area of LBNL identified as having "highly suitable potential habitat" for Alameda whipsnake (see **Figure 4.3-2, Sensitive Habitat at LBNL**). A qualified biologist evaluated the site-specific suitability of the project site for Alameda whipsnake on June 28, 2007 and concluded that this project would not adversely affect the Alameda whipsnake. The project site is located within a eucalyptus grove, has a grassland understory, and does not contain scrub communities often associated with the Alameda whipsnake. However, the project site is near areas containing high quality habitat for Alameda whipsnake. Specifically, coastal scrub habitats and open space along south facing slopes occur to the south of the project site that could be traversed. As such, when considered with nearby habitats, the project site may be part of a mosaic of habitats utilized by the species. While core habitat does not occur within the project boundary and Alameda whipsnake is not expected to permanently reside on the project site, the subspecies may temporarily utilize on-site habitats.

[2] The adopted critical habitat, while smaller than that proposed in 2005 (155,000 acres adopted, compared to 203,000 acres proposed), includes the same part of the Lab main site as included in the proposed critical habitat. Most of the 48,000 acres excluded from the adopted critical habitat are in eastern Contra Costa County, though smaller areas were excluded in the East Bay hills in western Contra Costa and southern Alameda counties.



SOURCE: Perkins+Will - September 2007, LBNL, ESA (2003); Swain Report - July 2006

FIGURE 4.3-2

Sensitive Habitat at LBNL

924-002-08/07

ALAMEDA WHIPSNAKE HABITAT ASSESSMENT
LAWRENCE BERKELEY NATIONAL LABORATORY
CITY OF BERKELEY, ALAMEDA COUNTY, CALIFORNIA

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July 10, 2006

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Swaim Biological Inc.

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1.0 INTRODUCTION

1.1 Report Purpose

This report provides an assessment of the potential for the Alameda whipsnake (*Masticophis lateralis euryxanthus*) to occur on Lawrence Berkeley National Laboratory (LBNL) in Berkeley, Alameda County, California. This information is needed to update the Long Range Development Plan. The Alameda whipsnake (AWS) is a both a State and Federally listed threatened species.

1.2 Project Location

The study area site is located adjacent on the University of California, Berkeley, in (UCB) the City of Berkeley, Alameda County, California (Figure 1). It is bordered to the north and west by residential development and developed portions of UCB and to the east and south by undeveloped lands owned by the University.

The majority of the study area has been excluded from the currently proposed critical habitat area for the AWS (Figure 1). Only a small portion near the eastern boundary of LBNL is within the newly proposed critical habitat for the Alameda whipsnake (U. S. Fish and Wildlife Service, 2005).

1.3 Alameda Whipsnake Ecology

In order to provide a context for the conclusions of the habitat assessment, a summary of the information known about habitat use by the Alameda whipsnake is provided below.

The Alameda whipsnake is a slender, fast moving, diurnal snake with a narrow neck and relatively broad head. The dorsal color is sooty-black with yellow-orange dorso-lateral stripes. The anterior portion of the stripes and ventral surface of the snake are heavily pigmented with orange-rufous coloration. Adults reach up to five feet in length.

The Alameda whipsnake is associated with chaparral, Diablan sage scrub, northern coyote brush scrub, and riparian scrub communities and the adjacent mosaic of grassland and wood habitats found in Alameda and Contra Costa Counties. Swaim (1994) found that the home ranges (convex polygon method) of six radio-equipped whipsnakes were centered in scrub communities. Within those home ranges, Alameda whipsnakes had one or more “core areas” or areas of concentrated use. Habitat in the areas of concentrated use was open or partially open canopy scrub on slopes with northeast, east, southeast, south, or southwest aspect. Rock outcrops and talus were also abundant within the core areas of the Alameda whipsnake. There was also a high degree of spatial overlap of home ranges and core areas of five individuals monitored at Tilden Regional Park. Overlap of home ranges may occur in areas where resources, such as food are abundant (Mace et al. 1983; Gregory et al. 1987; Hiscocks and Perrin 1988) and specific habitat requirements are met.

Although “core areas” had certain parameters, the range of habitat use by individual AWS and AWS populations is much broader. AWS use all aspects, a wide range of canopy cover and types of vegetation, and areas without rock outcrops.

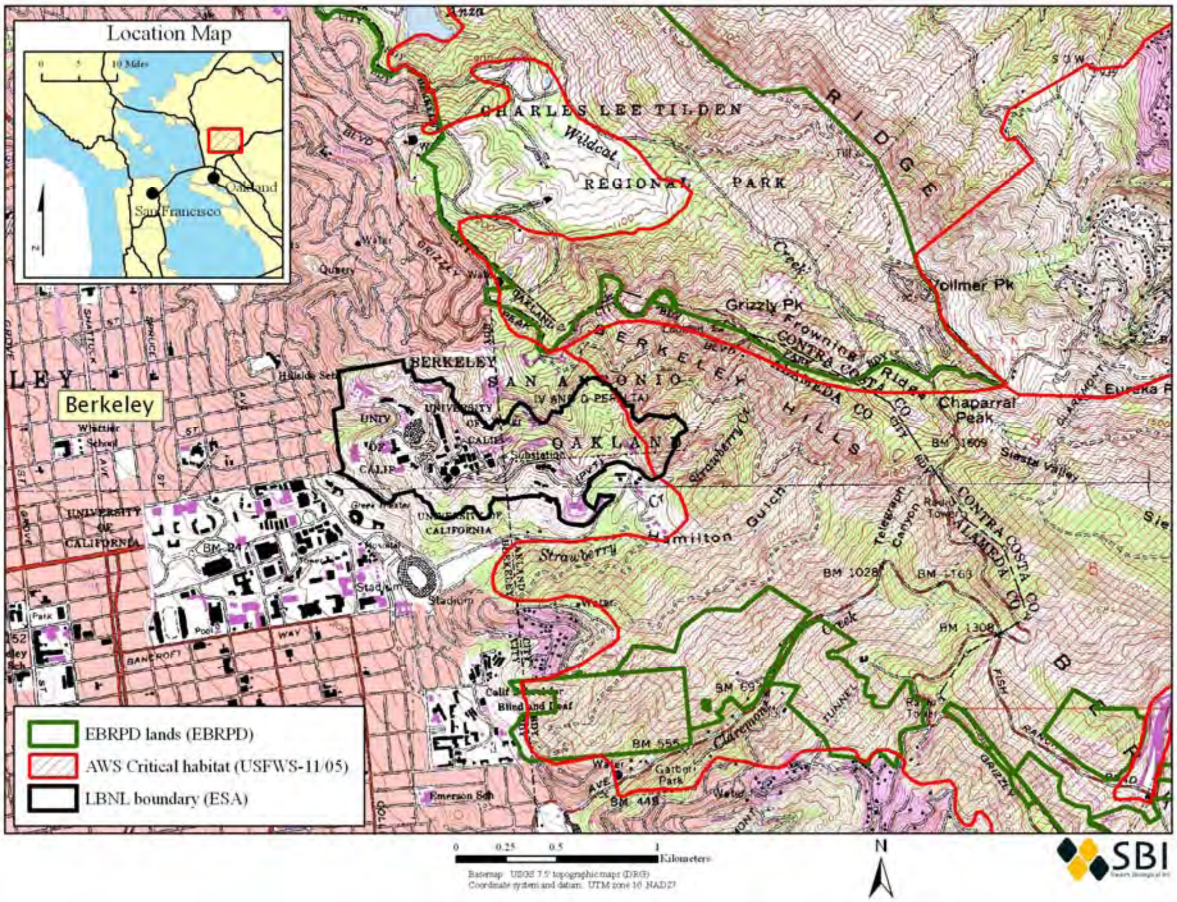

Figure 1. Regional Location

Studies of Alameda whipsnakes equipped with radio transmitters and existence of observations of free-ranging whipsnakes outside of scrub have shown that they also utilize grassland, oak woodland/savanna, oak bay woodland, and adjacent to chaparral and scrub communities even the understory of small Eucalyptus stands with scrub understory (Swaim 1994, Swaim Biological Consulting 2000a, 2000b, 2002, 2003, Alvarez et al. 2005). Grassland habitats were used by male whipsnakes most extensively during the mating season in spring (Swaim 1994). Rock outcrops in and near scrub are an important feature of high quality whipsnake habitat because they provide cover and promote lizards, which are important prey for the Alameda whipsnake (Stebbins 1985, Swaim 1994, Harry Greene, pers. Comm.). Although most radio locations were within 100 feet of scrub, whipsnakes also ranged into the surrounding grassland for distances of greater than 500 feet (Swaim 1994). A recent review of whipsnake locality data revealed many observations of whipsnakes at locations over 500 feet from scrub and ranging up to approximately four miles (Swaim Biological Consulting 2000a, 2000b, 2002, 2003, Alvarez et al. 2005).

The frequency of use of non-scrub habitats is probably highest in xeric habitats adjacent to scrub, especially when rock outcrops and drainages with riparian vegetation are present. At a minimum, the function of the use of non-scrub habitats is related to foraging, mate-searching, and dispersal. Non-scrub habitats that are within the general mosaic of scrub/grassland /woodland in the range of the AWS are also essential for gene flow because of the patchy and dynamic nature of scrub and chaparral habitats.

Although telemetry data to date (Swaim 1994) has provided a great deal of information regarding habitat use by the Alameda whipsnake, it has several limitations. All of the telemetry data is biased toward the habitat use, needs/patterns of the largest of adults (4+ feet). Little information is available for smaller adults, juveniles and hatchlings, which may be more likely to use non-scrub habitats for dispersal and foraging. Another limiting factor of the Swaim (1994) telemetry data is sample size. Only five individuals (two female, three male) were monitored for periods greater than approximately three months.

2.0 METHODS

2.1 AWS Distribution

Information on distribution of the AWS in the project area was gathered from sources including the California Natural Diversity Database (CNDDB), the California Academy of Sciences (CAS), Museum of Vertebrate Zoology, and other knowledgeable biologists working in the San Francisco Bay Area.

2.2 Habitat Assessment

Field assessments of the study area were conducted on May 31, 2005 and November 30, 2005 to determine the type and condition of habitats present on the site and in the vicinity of the study area. We also used 2004 color aerial photographs to determine the types of habitat present in the vicinity of this parcel (approximately one kilometer).

3.0 RESULTS

3.1 AWS Distribution

The observations of AWS closest to the project site are from UCB Ecological Study Area southeast and east of the LBNL, (Figure 2). These observations include multiple historic and recent (2004) observations of AWS from areas that are still undeveloped. Several of the observations are from the Ecological Study Area owned and managed by UCB.

3.2 Habitat Assessment

Undeveloped habitats that remain within LBNL have been mapped by Environmental Science Associates and include arroyo willow scrub, grassland, bay woodland, coastal scrub, conifer stands, Eucalyptus stands, oak woodland, oak-bay woodland, and ornamental (Figure 3). Although much of the study area is already developed with existing buildings, roadways and landscaping, coastal scrub is distributed in several locations on and adjacent to LBNL (Figure 3). None of these areas have been specifically surveyed by trapping, but have highly suitable potential habitat and direct connection to areas where AWS have been documented. The presence of these scrub patches within the mosaic of other habitats (woodland, grassland) is typical of habitats that are known to support the AWS. There are no significant barriers between the documented occurrences of AWS near LBNL and the LBNL site itself. Although roads are deterrents, they are not barriers because AWS will cross them (CNDDB 2005, K. Swaim personal observation).

The largest patches of scrub are found in the area of LBNL northeast of Centennial Drive and range up to 2.79 acres in size. Several of these scrub patches are contiguous with off-site scrub making the patch size even larger. The undeveloped area along the southern boundary of LBNL also contains several patches ranging up to 1.1 acres in size. This southern portion of LBNL is adjacent to an undeveloped area between Centennial Drive and LBNL. This area contains several patches of scrub. Only two very small patches of scrub (0.05 and 0.06 acres) are located within the undeveloped area along the northern boundary of LBNL. However, there are larger areas of scrub that are close to the northern boundary of LBNL in the undeveloped area between the LHS and LBNL.

4.0 CONCLUSIONS

Based on the habitat assessment we prepared a map that designates three types of areas on the site (Figure 3).

1) Areas where highly suitable potential AWS habitat is present. AWS could use any of the habitat types in these areas. This includes the small eucalyptus and conifer stands that are present, although use of these habitats would be less than in more open habitats. These areas include the portion of LBNL northeast of Centennial Drive and the southern portion of LBNL which is north of Centennial Drive (Appendix A, B)

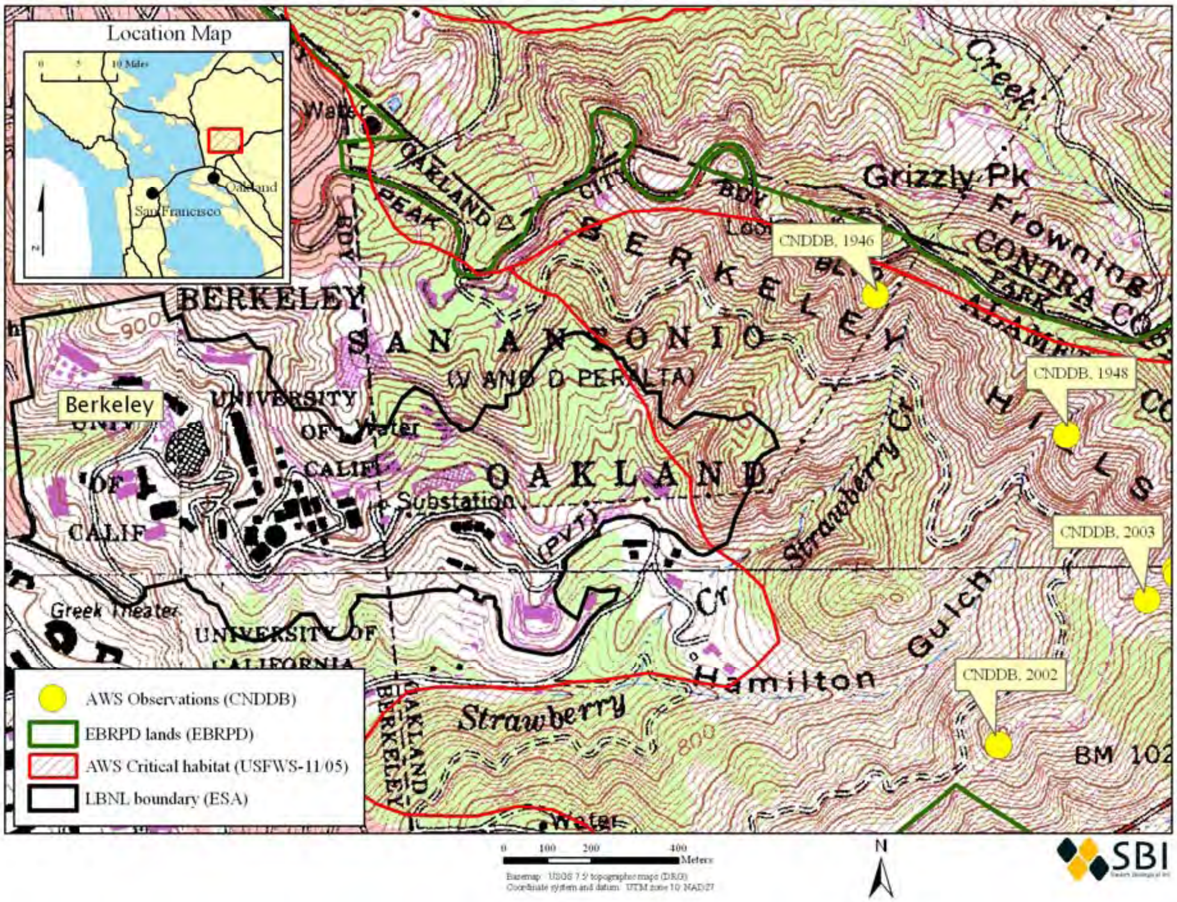

Figure 2. Nearest AWS Observations to Study Area.

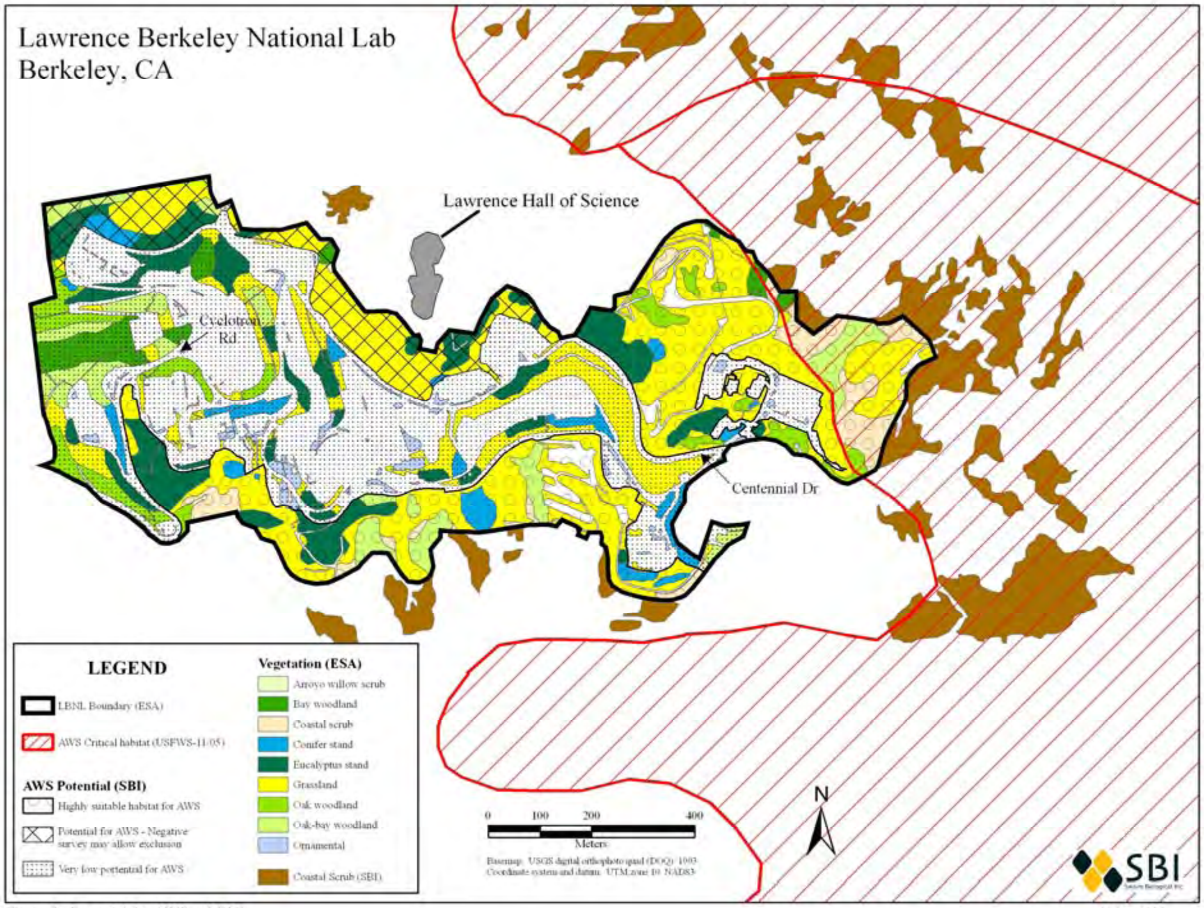

Figure 3. Potential for AWS at LBNL.

1 Mar., 2006

Figure 3. Potential for AWS at LBNL

2) Areas where there is potential habitat (some scrub is present and the patch size is potentially large enough to support a populations), but the potential for AWS may be lower. The lower potential for presence is due to fragmentation caused by buildings and roads that has resulted in isolation from larger areas of habitat and degradation of the habitat in those isolated areas through vegetation management that eliminates ground cover. The area considered to be potential habitat is the northern boundary area below the Lawrence Hall of Science (LHS). Several scrub patches are present in the undeveloped area between LBNL and LHS and a small population of AWS may be present in the designated area. (Appendix C)

3) Areas where AWS are not likely to occur due to small habitat patch size and isolation from scrub habitats by multiple paved roads, buildings, and bare slopes. The AWS would not be expected to user remainder of the site on any significant or predictable basis.

5.0 SURVEY RECOMMENDATIONS

To determine the actual status of the AWS at LBNL, trapping surveys would need to be conducted at the areas in question. Informal consultation with the USFWS and CDFG would be needed to determine if a survey could be designed to determine negative findings for the AWS and result in projects that would require that no take avoidance or mitigation measures be implemented.

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Appendix A

Habitat Conditions in Area of LBNL northeast of Centennial Drive

Appendix B

Habitat Conditions in Area Along the Southern Boundary of LBNL

Appendix C

Habitat Conditions in the Undeveloped area Along the Northern Boundary of LBNL and the LHS

LBNL

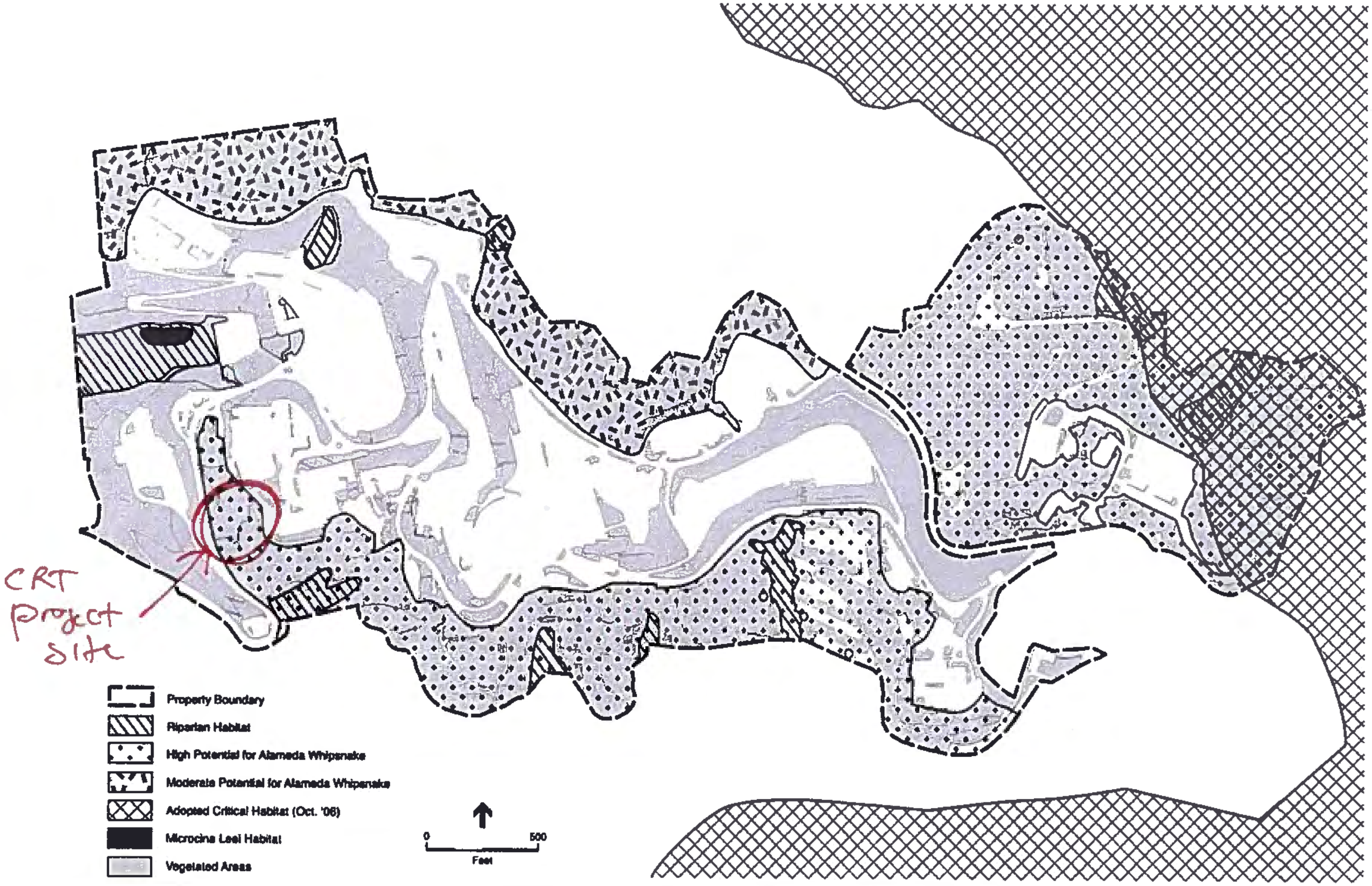
2006 Long Range Development Plan Environmental Impact Report

(July 2007)

SOURCE: LBNL; ESA (2003)

LBNL 2006 Long Range Development Plan . 201074

Figure IV.C-1
Vegetation at LBNL



SOURCE: LBNL; ESA (2006)

LBNL 2006 Long Range Development Plan . 201074

Figure IV.C-2
Sensitive Habitat at LBNL

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts on special bats. For the reasons stated above, potential individual projects under the LRDP such as those identified in the Illustrative Development Scenario could adversely affect special-status bats, and the above impact statement would apply. For the reasons stated above, and with implementation of Mitigation Measure BIO-4, the impact of such projects on special-status bats would be less than significant.

Impact BIO-5: Implementation of the 2006 LRDP could result in take or harassment of Alameda whipsnakes. (Significant; Less than Significant with Mitigation)

There has never been a reported sighting of an Alameda whipsnake on the LBNL hill site or its immediate vicinity. Though habitat types and features used by Alameda whipsnakes may vary, home ranges typically are centered on areas of scrub habitats with open to partially open canopy, on south-, southeast-, east-, and southwest-facing slopes. Rock outcrops are important for protection from predators and as habitat for western fence lizards and other prey species (Swaim, 1994). However, recent surveys and studies undertaken elsewhere in the region have shown that Alameda whipsnake can be found in a wider variety of habitats than previously thought. For example, whipsnakes have been found in grasslands with very little scrub present, in coastal scrub with dense canopy cover, and in patches of scrub less than one-half acre in size (Swaim, 2003). These recent findings suggest the possibility that whipsnakes could be inhabiting, or disperse through, areas of the LBNL site where coastal scrub habitat occurs in a mosaic with other habitat types such as grassland or woodland. A recent whipsnake habitat assessment of the LBNL hill site (Swaim, 2005) found that potential whipsnake occurrence would be most likely in the easternmost portion of the Lab that is contiguous with open space to the north and east and along the south-facing slopes of Strawberry Canyon. Both of these areas are primarily open space with a mosaic of grassland, coastal scrub, riparian woodland, and stands of non-native trees and provide a potential dispersal corridor from areas identified as critical habitat for the species (USFWS, 2006) to areas of coastal scrub with potential suitability for the whipsnake.

The 2005 LBNL habitat assessment identified and mapped potential for Alameda whipsnake occurrence based on habitat types present and other factors, including habitat fragmentation and existing land uses. Areas designated as having high potential for whipsnakes were those that included relatively large patches of coastal scrub in a mosaic of other habitat types and that were contiguous with larger open space areas and known occupied habitat and/or proposed critical habitat. Based on these factors, these are areas where whipsnakes are considered to have a high potential to occur (Swaim, 2005). Areas designated as having moderate potential were those that contained smaller patches of scrub in a mosaic with other habitat types but where there was also a fairly significant degree of fragmentation and habitat degradation and a lesser degree of contiguity with larger areas of less disturbed potential habitat. These areas may support a small whipsnake population (Swaim 2005). The habitat assessment found that the whipsnake would not be expected to use the remainder of the site (i.e., existing highly developed areas) on any predictable basis (Swaim, 2005).

After conducting site visits during the summer of 2000, the USFWS determined that most of the LBNL site, including areas with existing facilities, should be excluded from its final critical habitat listing[20,21] (USFWS, 2000). The 2000 designation of critical habitat was rescinded in 2003 but a new critical habitat designation was proposed in 2005 and adopted in October 2006 that, similar to the 2000 designation, includes the easternmost portion of the LBNL site.[22] This area is designated as a fixed constraint under the 2006 LRDP. Based on the habitat assessment, areas with moderate to high potential for whipsnake occurrence were mapped as sensitive habitat in Figure IV.C-2 in this document and should be avoided to the extent feasible. With the exception of potential development in the eastern portions of the hill site, the majority of development proposed under the 2006 LRDP can be considered infill development and would not occur in or near areas that provide suitable habitat for the Alameda whipsnake or within areas proposed as critical habitat. Mitigation Measures (BIO-5a through BIO-5f) would be implemented as directed below at project sites located within areas identified as having moderate to high potential for whipsnake occurrence to ensure that the species is protected to the greatest extent possible during project construction (see Figure IV.C-2).

> **Mitigation Measure BIO-5a:** With the approval of the USFWS on a case-by-case basis, relocate any snake encountered during construction that is at risk of harassment; cease construction activity until the snake is moved to suitable refugium. Alternatively, submit a general protocol for relocation to the USFWS for approval prior to project implementation.

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20 Critical habitat for the Alameda whipsnake was rescinded by court order on May 9, 2003. For the purposes of this analysis, the concept is still relevant in that the designation of critical habitat implies a high likelihood of species' presence where critical habitat elements are found. Even though critical habitat has been rescinded, the species is still fully protected under the FESA. In addition, the USFWS (2002) published a draft recovery plan that includes the species, and areas that were formerly designated as critical habitat units are now designated as recovery units under the plan. Finally, critical habitat for the species was re-proposed in October 2005 (USFWS, 2005d) and, as adopted in October 2006 (USFWS, 2006), includes the easternmost portion of the Lab site.

21 As noted in Chapter I, Introduction, because the LRDP is a University-mandated planning document, it is not subject to review under the National Environmental Policy Act (NEPA). NEPA review would be required for LRDP development projects subject to an authorization or decision by the U.S. Department of Energy or another federal agency. In such instances, consultation with the USFWS would be required prior to implementation of the LRDP, pursuant to Section 7 of the FESA. This consultation would likely be informal and consist of documentation presented to the USFWS by the federal lead agency for the project indicating that the development project would have no impacts on Alameda whipsnake or whipsnake habitat.

22 The adopted critical habitat, while smaller than that proposed in 2005 (155,000 acres adopted, compared to 203,000 acres proposed), includes the same part of the Lab main site as included in the proposed critical habitat. Most of the 48,000 acres excluded from the adopted critical habitat are in eastern Contra Costa County, although smaller areas were excluded in the Easy Bay hills in western Contra Costa and southern Alameda counties.

Mitigation Measure BIO-5b: Conduct focused pre-construction surveys for the Alameda whipsnake at all project sites within or directly adjacent to areas mapped as having high potential for whipsnake occurrence. Project sites within high potential areas shall be fenced to exclude snakes prior to project implementation. This would not include ongoing and non-site specific activities such as fuel management.

Methods for pre-construction surveys, burrow excavation, and site fencing shall be developed prior to implementation of any project located within or adjacent to areas mapped as having high potential for whipsnake occurrence. Such methods would be developed in consultation or with approval of USFWS for any development taking place in USFWS officially designated Alameda whipsnake critical habitat. Pre-construction surveys of such project sites shall be carried out by a permitted biologist familiar with whipsnake identification and ecology (Swaim, 2002). These are not intended to be protocol-level surveys but designed to clear an area so that individual whipsnakes are not present within a given area prior to initiation of construction. At sites where the project footprint would not be contained entirely within an existing developed area footprint and natural vegetated areas would be disturbed any existing animal burrows shall be carefully hand-excavated to ensure that there are no whipsnakes within the project footprint. Any whipsnakes found during these surveys shall be relocated according to the Alameda Whipsnake Relocation Plan. Snakes of any other species found during these surveys shall also be relocated out of the project area. Once the site is cleared it shall then be fenced in such a way as to exclude snakes for the duration of the project. Fencing shall be maintained intact throughout the duration of the project.

Mitigation Measure BIO-5c: (1) A full-time designated monitor shall be employed at project sites that are within or directly adjacent to areas designated as having high potential for whipsnake occurrence, or (2) Daily site surveys for Alameda whipsnake shall be carried out by a designated monitor at construction sites within or adjacent to areas designated as having moderate potential for whipsnake occurrence.

Each morning, prior to initiating excavation, construction, or vehicle operation at sites identified as having moderate potential for whipsnake occurrence, the project area of applicable construction sites shall be surveyed by a designated monitor trained in Alameda whipsnake identification to ensure that no Alameda whipsnakes are present. This survey is not intended to be a protocol-level survey. All laydown and deposition areas, as well as other areas that might conceal or shelter snakes or other animals, shall be inspected each morning by the designated monitor to ensure that Alameda whipsnakes are not present. At sites in high potential areas the monitor shall remain on-site during construction hours. At sites in moderate potential areas the monitor shall remain on-call during construction hours in the event that a snake is found on-site. The designated monitor shall have the authority to halt construction activities in the event that a whipsnake is found within the construction footprint until such time as threatening activities can be eliminated in the vicinity of the snake and it can be removed from the site by a biologist permitted to handle Alameda whipsnakes. The USFWS shall be notified within 24 hours of any such event.

Mitigation Measure BIO-5d: Alameda whipsnake awareness and relevant environmental sensitivity training for each worker shall be conducted by the designated monitor prior to commencement of on-site activities.

All on-site workers at applicable construction sites shall attend an Alameda whipsnake information session conducted by the designated monitor prior to beginning work. This session shall cover identification of the species and procedures to be followed if an individual is found on-site, as well as basic site rules meant to protect biological resources, such as speed limits and daily trash pickup.

Mitigation Measure BIO-5e: Hours of operation and speed limits shall be instituted and posted.

All construction activities that take place on the ground (as opposed to within buildings) at applicable construction sites shall be performed during daylight hours, or with suitable lighting so that snakes can be seen. Vehicle speed on the construction site shall not exceed 5 miles per hour.

Mitigation Measure BIO-5f: Site vegetation management shall take place prior to tree removal, grading, excavation, or other construction activities. Construction materials, soil, construction debris, or other material shall be deposited only on areas where vegetation has been mowed.

Areas where development is proposed under the 2006 LRDP are subject to annual vegetation management involving the close-cropping of all grasses and ground covers; this management activity would be performed prior to initiating project-specific construction. Areas would be re-mowed if grass or other vegetation on the project site becomes high enough to conceal whipsnakes during the construction period. In areas not subject to annual vegetation management, dense vegetation would be removed prior to the onset of grading or the use of any heavy machinery, using goats, manual brush cutters, or a combination thereof.

Most of the above mitigation measures are based on avoidance measures developed in informal consultation with the USFWS during site surveys for the water tank and fire road realignment components of the LBNL Sitewide Water Distribution Upgrade project, which was located in the easternmost portion of LBNL. The incorporation of these mitigation measures into that project resulted in an informal determination by the USFWS that the Sitewide Water Distribution Upgrade project would not be likely to adversely affect Alameda whipsnake or its critical habitat (USFWS, 2000; LBNL, 2001a; Philliber, 2002).

The incorporation of these measures, including the measures identified above under Mitigation Measures BIO-5a for all project sites and BIO-5b and BIO-5c for sites within high potential areas, would reduce potential impacts resulting from implementation of projects under the LRDP to less-than-significant levels. Mitigation Measure BIO-5a is not necessary prior to LRDP project activities to reduce a potentially significant impact to a less-than-significant level, as a project could be halted until a whipsnake relocation plan was approved. However, LBNL intends to voluntarily enact this mitigation measure proactively to minimize potential project delays if whipsnake were encountered.

Significance after Mitigation: Less than significant.

Project Variant. Compared to the LRDP, the project variant would not result in any change in buildings or structures developed, and therefore impacts would be the same as those described for the proposed project. With incorporation of Mitigation Measures BIO-5a through BIO-5f, the impact would be less than significant.

Individual Future Projects/Illustrative Development Scenario. The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. Actual overall development that is approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. The scenario was developed before the 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, and thus the scenario includes an overall level of potential development that is greater than is being proposed in the 2006 LRDP. Each of the proposed buildings that is included in the scenario, however, might be constructed pursuant to the 2006 LRDP, and thus the scenario remains an appropriate and conservative basis for the evaluation of impacts on the Alameda Whipsnake. Locations of buildings, configurations, uses, and other features of actual development may vary from the scenario. All development (demolition or construction) occurring within or directly adjacent to the areas mapped as having high to moderate potential for Alameda whipsnake occurrence in Figure IV.C-2 would incorporate the mitigation measures presented above. This development could include Illustrative Development Scenario buildings S-1, S-8, S-9, S-11, S-12, S-13, S-14, and S-15. Also included would be roads R-1, R-2, and R-5; parking lots PL-8, PL-9, and PL-10; and parking structure PS-2. For the reasons stated above, potential development in these areas could result in take or harassment of Alameda whipsnakes.

Mitigation Measures BIO-5a, BIO-5b, and BIO-5c(1) through BIO-5f would apply to projects that would occur within or directly adjacent to areas mapped as having high potential for whipsnake occurrence. This development would include, but not be limited to, development identified in the Illustrative Development Scenario as S-9, S-11, S-12, S-13, S-14, and S-15; R-1 and R-2; PL-8, PL-9 and PL-10; and PS-2.

Mitigation Measures BIO-5a, BIO-5c(2) through BIO-5f would apply to projects that would occur within or directly adjacent to areas mapped as having moderate potential for whipsnake occurrence. This development would include, but not be limited to, development identified in the Illustrative Development Scenario as S-1, S-8, and R-5. No mitigation would be required for development projects occurring in already highly developed areas.

With implementation of Mitigation Measures BIO-5a through BIO-5f as indicated above, the impact from potential individual projects under the LRDP such as those described in the Illustrative Development Scenario associated with potential take of Alameda whipsnake would not result in a substantial adverse effect on special-status species, nor interfere substantially with the movement of any resident or migratory species or impede the use of native wildlife nursery sites, and therefore the impact of such projects on the whipsnake would be reduced to a less-than-significant level.

United States Department of the Interior

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Mr. Kim Abbott
Environmental Program Manager
Department of Energy
Office of Science
Berkeley Site Office
Lawrence Berkeley National Laboratory
1 Cyclotron Road, MS-90-1023
Berkeley, California 94720

Subject: Informal Consultation on the Proposed Construction of the Computational and Theory Facility at the Lawrence Berkeley National Laboratory

Dear Mr. Abbott,

This letter responds to the Department of Energy's (DOE), Lawrence Berkeley National Laboratory (LBNL) January 21, 2011, letter requesting informal consultation with the U.S. Fish and Wildlife Service (Service) for the proposed construction of the Computational and Theory Facility (CRT) in the City of Berkeley, Alameda County, California. Your letter was received by the Service on January 21, 2011. At issue are the potential effects of the proposed CRT on the threatened Alameda whipsnake (*Masticophis lateralis euryxanthus*). This response is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

The Service used the following information during our review of your request: (1) your letter to the Service dated January 21, 2011; (2) Enclosures 1, 2 and 3 of your letter, which included the *Site Specific Study for the Construction of the CRT*, the *Swaim 2006 Report*, and an excerpt from the *2006 Long Range Development Plan Environmental Impact Plan Report*, dated July 2007; (3) the site plan map; (4) the *Draft Environmental Assessment for Computational and Theory Facility Project DOE/EA – 1700*, dated September 2010; (5) the January 25, 2011, site visit conducted by the Service with Kim Abbott, Henry Martinez, and Jeff Philliber of the LBNL, DOE; (6) additional conservation measures proposed and sent to the Service via electronic mail on January 21, 2011; and (7) other information available to the Service.

The proposed CRT involves the construction of a new three-story building that will consist of an approximately 32,000 square-foot computing floor with a high ceiling and two additional floors of office space for a total of approximately 139,715 square feet of space on a 2.25 acre site situated between two densely developed building complexes to the east, the LBNL's main roadway to the west and north, and an area of undeveloped "perimeter open space" to the south above UC Berkeley's Memorial Stadium. All of the access routes are proposed to be on existing paved roads. Only necessary vehicles and construction equipment will be allowed within the immediate project site. The LBNL proposes to begin construction of the CRT in early 2011 and complete the project by late 2013.

Alameda whipsnakes have not been observed or captured during protocol-level surveys conducted by Swaim (2006) (Enclosure 2). No suitable habitat for breeding exists within the project action area. There has been only one documented occurrence of the Alameda whipsnake at the 202-acre LBNL site in its 70-year history. This occurrence was reported at the far southeastern corner of the LBNL hill site, approximately two-thirds of a mile from the project action area.

The Service concurs with your determination that the proposed CRT project is not likely to adversely affect the Alameda whipsnake based on the following:

1. The site, which is predominantly vegetated with eucalyptus and non-native grassland, does not contain suitable habitat to support Alameda whipsnake.
2. The site is disturbed, highly constricted, and surrounded on two of three sides by busy roadways and development.
3. Although numerous biological surveys have been conducted on the proposed CRT site, no evidence of Alameda whipsnake presence has been documented in this area.
4. The LBNL will employ a rigorous set of preventative measures specifically designed to avoid incidental taking of the Alameda whipsnake. These are known as Standard Project Features (SPFs). The SPFs were designed in past informal consultation with the Service; with Karen Swaim; and with other professional consulting biologists. LBNL proposes to implement the following SPFs for the proposed CRT project.
5. Project construction SPFs for the Alameda whipsnake include:
    a. Alameda whipsnake identification and awareness training will be provided for all construction personnel;
    b. Service-approval and designation of official on-site biological monitors prior to construction;
    c. "Stop work" protocols to be established prior to construction commencement;
    d. Vegetation management (grass and brush removal) will be conducted prior to project commencement and maintained throughout construction;
    e. Implementation of pre-construction surveys and exclusion fencing for snakes, as necessary;
    f. Hours of operations, project lighting, and off-road speed limits will be approved and established before project construction begins;
    g. Full time monitoring and daily site surveys prior to daily work commencement will be conducted by the Service-approved biological monitor.

The following conservation measures proposed by the LBNL, in addition to the above SPFs, will be implemented:

1. Hours of operation and speed limits will be instituted and posted. All construction activities that take place on the ground (as opposed to within buildings) at the construction sites will be performed during daylight hours and with suitable lighting so that any snakes present may be seen. Vehicle speed on the construction site will not exceed five miles per hour.
2. Excavations will be inspected for entrapped wildlife before commencement of construction activities every morning. Any animals discovered will be allowed to escape voluntarily and without harassment before construction activities resume. Pipes that are stored on the site will be inspected for trapped animals before the pipe is used in any way. Pipes, in or adjacent to trenches left open overnight, will be capped.

The following habitat quality measure proposed by the LBNL, in addition to their currently established program developed to protect and enhance habitat to support Alameda whipsnake within their campus, will be implemented:

1. In an effort to minimize existing threats to Alameda whipsnakes within LBNL, all current on-site erosion control materials (e.g. straw wattle) that contain plastic monofilament will be replaced with coconut fiber or similar products during all regular maintenance activities. From this point forward, LBNL will use only the coconut fiber types of erosion control materials throughout the entire campus.

As provided in 50 CFR § 402.14, initiation of formal consultation is required where there is discretionary Federal agency involvement or control over the action (or is authorized by law) and if: (1) new information reveals effects of the agency action that may affect a listed species or critical habitat in a manner or to an extent not considered in this review; (2) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (3) a new species is listed or critical habitat is designated that may be affected by the action.

Please contact Florence Gardipee, Fish and Wildlife Biologist, or Ryan Olah, Coast Bay Branch Chief, at (916) 414-6600, or by email (Flo_Gardipee@fws.gov or Ryan_Olah@fws.gov), if you have any questions regarding this response on the proposed construction of the Computational and Theory Facility

Sincerely,

E. Tattersall

Eric Tattersall
Assistant Deputy Field Supervisor

cc: Conrad Jones, California Department of Fish and Game, Napa, California