

LAWRENCE BERKELEY NATIONAL LABORATORY LONG-RANGE DEVELOPMENT PLAN

Draft Environmental Impact Report

Prepared for:
Lawrence Berkeley National Laboratory

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CHAPTER I

Introduction

I.A. Overview

This environmental impact report (EIR) has been prepared pursuant to the applicable provisions of the California Environmental Quality Act (CEQA) and its implementing guidelines (CEQA Guidelines), and the Amended University of California Procedures for Implementation of the California Environmental Quality Act (UC CEQA Procedures). The University of California (UC or the University) is the lead agency for this EIR, which examines the overall effects of implementation of the proposed 2006 Long Range Development Plan (LRDP; also referred to herein as the “project” for purposes of CEQA) for Lawrence Berkeley National Laboratory (LBNL; also referred to as “Berkeley Lab,” “the Laboratory,” or “the Lab” in this document).

An LRDP is a land use plan that guides overall development of a site. The Lab serves as a special research campus operated by the University employees, but it is owned and financed by the federal government and as such it is distinct from the UC-owned Berkeley Campus. As a campus operated by the University of California, the Laboratory is required to prepare an EIR for an LRDP when one is prepared or updated pursuant to Public Resources Code Section 21080.09. The adoption of an LRDP does not constitute a commitment to, or final decision to implement, any specific project, construction schedule, or funding priority. Rather, the proposed 2006 LRDP describes an entire development program of approximately 980,000 gross square feet of new research and support space construction and 320,000 gross square feet of demolition of existing facilities, for a total of approximately 660,000 gross square feet of net new occupiable space for the site through 2025. Specific projects will undergo CEQA review at the time proposed to determine what, if any, additional review is necessary prior to approval. As described in Section 1.4.2, below, and in Chapter 3 of this EIR (the Project Description), the size of the project has been reduced since the Notice of Preparation for this EIR was issued. This reduction was in response to consultation with the City of Berkeley as well as other factors.

CEQA requires that, before a decision can be made by a state or local government agency to approve a project that may have significant environmental effects, an EIR must be prepared that fully describes the environmental effects of the project. The EIR is a public informational document for use by University decision-makers and the public. It is intended to identify and evaluate potential environmental consequences of the proposed project, to identify mitigation measures that would lessen or avoid significant adverse impacts, and to examine feasible alternatives to the project. The information contained in the EIR is reviewed and considered by the lead agency prior to its action to approve, disapprove, or modify the proposed project.

CEQA states that the lead agency (in this case, the University) shall neither approve nor implement a project as proposed unless the significant environmental effects of that project have been reduced to less-than-significant levels, essentially “eliminating, avoiding, or substantially lessening” its expected impacts. If the lead agency approves the project despite residual significant adverse impacts that cannot be mitigated to less-than-significant levels, the agency must state the reasons for its action in writing. This “Statement of Overriding Considerations” must be included in the record of project approval.

This EIR has been prepared to inform The Regents of the University of California (“The Regents”), responsible agencies, trustee agencies, and the public of the proposed project’s environmental effects. The EIR is intended to publicly disclose those impacts that may be significant and adverse, describe the possible measures that would mitigate or avoid such impacts, and describe a reasonable range of alternatives to the project.

I.B. Relationship between LBNL, the University, and the U.S. Department of Energy

LBNL is a Federally Funded Research and Development Center, as defined in the Federal Acquisition Regulations and Department of Energy Acquisition Regulations. It is a Government Owned and Contractor Operated Federal Laboratory, funded by the U.S. government to meet specific long-term technical needs that cannot be met by any other single organization. From a contractual standpoint, the University is a Management and Operating (M&O) contractor of LBNL as defined under the U.S. Department of Energy (DOE) Acquisition Regulations (DEARs) – specifically DEAR Part 970. As the Laboratory’s M&O Contractor, UC is responsible for providing the intellectual leadership and management expertise necessary and appropriate to manage, operate, and staff the Laboratory; accomplish the missions and activities assigned and funded by DOE to the Laboratory; administer the DOE/UC Prime Contract; and provide UC oversight of the Laboratory’s contract compliance and performance. The Prime Contract (Contract 31) provides the overall statement of work to be performed and the terms and conditions of its performance for the federal government. The contract calls for budget and program planning that is coupled to the Department of Energy and its plans and the federal budgeting process.

Funds provided to LBNL by DOE are deposited from the U.S. Treasury into an account that is owned by the federal government under an agreement between the Department of Energy, The Regents of the University of California and the Bank (Union Bank). While the University is authorized to withdraw funds for salaries and other expenses, it does not own the account. All expenses at the Laboratory, drawn from the account, must be consistent with Federal Cost Accounting standards and are audited by the federal government. Consistent with federal guidelines for federal facilities, payments for state and local taxes are not allowable expenses. As a federal organization, the Laboratory operates under federal statutes and regulations and allows for those operational expenses, including those federal requirements (such as environmental permits) delegated to the State and local governments.

The federal government leases land at Berkeley Lab from The Regents and constructs federally owned buildings on the leased lands. Equipment at the Laboratory is also acquired and owned by the federal government. The University's role is to provide the intellectual scientific and management leadership, and to staff and operate the Laboratory as provided in Contract 31 between The Regents and the Department of Energy. With the approval of The Regents, the President appoints the Laboratory Director. The appointment of the Laboratory Directors is also subject to the approval of DOE. The Director is an Officer of the University of California.

Recently DOE has begun encouraging its contractors to assist in providing facilities for the National Laboratories through third-party financing. In this manner, DOE will lease buildings on a site that may have been constructed by other parties. DOE issues a Statement of Mission need for the construction of the facilities, and it enters into lease agreements for the occupancy. The potential physical and environmental scope of any third-party financed facilities within the 202-acre LBNL main hill site is included in the proposed LRDP and this EIR.

Because The Regents may re-acquire full responsibility for the lands should the federal government close the Laboratory, and for effective ongoing management, The Regents hold themselves accountable for the stewardship of the Laboratory within the State of California. The Regents require and approve the University-defined LRDP and require that its approval be consistent with the University's policy that an LRDP undergo CEQA review and approval.

In summary, the role of DOE is to determine the federal research mission and program, provide the funding, and oversee the execution of DOE programs. The Laboratory planning is coupled to DOE and federal program planning guidelines. UC provides the intellectual resources for running the Lab, and oversees its relationship to the University, the community, and its contract compliance with DOE. The LBNL serves as a special research campus operated by University employees, but it is owned and financed by the federal government, and as such it is distinct from the UC-owned Berkeley Campus.

I.C. Project Background

University of California campuses, including LBNL, are required to maintain and periodically update their Long Range Development Plans. An LRDP is a planning document that establishes a general framework and direction for the physical development of an institution over a specific period of time. The University of California further mandates that any new LRDP be accompanied by an EIR pursuant to CEQA. Any new LBNL LRDP and EIR must be approved by The Regents of the University of California before the LRDP can be implemented. At that time, the Draft LRDP would be published as a final LRDP.

LBNL's existing LRDP and EIR were approved in 1987. The EIR was updated by a Supplemental EIR in 1992 and an Addendum in 1997. Sufficient time has passed that a renewed statement of planning vision is appropriate for Berkeley Lab as it works to address national scientific challenges and research opportunities at the beginning of this new century.

I.D. Summary of Proposed Project

I.D.1 Existing Conditions Baseline

The Lab occupies approximately 100,000 square feet of off-site space at the UC Berkeley campus and approximately 338,000 gsf of other off-site leased spaces, mostly in Berkeley, Oakland, and Walnut Creek. (The Regents also own the Lab-occupied land at UC Berkeley; other off-site space is leased from private landowners.) The Regents do not own, but lease and control, along with DOE, the approximately 338,000 square feet of LBNL space leased on the commercial market off of the main LBNL hill site.

The LBNL site is a developed area that lies between UC Berkeley and residential neighborhoods of the City of Berkeley to the west and northwest. The UC Berkeley corporation yard, UC Berkeley recreation pools, sports fields, and walking trails, the UC Berkeley–managed Ecological Study Areas and the UC Berkeley Botanical Garden lie to the south, southeast, and east; and UC Berkeley–operated research and educational facilities lie to the northeast. Although developed, the LBNL site retains substantial vegetation and natural topographic features.

The Laboratory’s total adjusted daily population (ADP) at all locations is projected to increase from the current 4,375 to 5,375.¹ This EIR considers the effects of both maintaining current levels of off-site space and population, and of accommodating most off-site population back onto the hill site.

Since LBNL last updated its LRDP in 1987, Berkeley Lab has increased in size from 134 acres to 202 acres, primarily due to the transfer of management responsibility for Regents’ land that had been previously managed by UC Berkeley. These transfers were arranged to allow Berkeley Lab to implement a fuel management program that reduces risks of building damage from wildland fire, to facilitate more effective overall management of The Regents’ land in this area, and to support the orderly development of the Laboratory site. Berkeley Lab currently manages these additional lands under guidance of UC Berkeley’s LRDP and will manage the lands in accordance with the 2006 LRDP, pending approval of the Laboratory’s 2006 LRDP and EIR.

The CEQA Guidelines (Section 15125) require that an EIR describe the environmental conditions in the project vicinity as they existed at the time the Notice of Preparation (NOP) for the project was published. The Guidelines state that “this environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant.” LBNL issued the NOP for the proposed LRDP on October 28, 2003, and therefore this EIR uses 2003 as the baseline year for evaluating the project’s impacts on its environmental setting. To provide a conservative analysis, however, this EIR selectively uses more recent (post-2003) data, where appropriate and where using such data does not make the analysis less conservative.

¹ The ADP calculation includes the Lab’s full-time-equivalent employment plus 40 percent of annual guests, an estimate of the population present on any given day based on historic surveys. The percentage of guests who are on-site will be periodically reviewed and the ADP guest factor periodically updated during the term of the LRDP.

I.D.2 Proposed Project

The proposed project is the adoption and implementation of the proposed LBNL 2006 LRDP. The Draft LRDP was published concurrently with this EIR in January 2007 and is incorporated by reference into this EIR. The proposed 2006 LRDP has been publicly circulated in January 2007 with this EIR.

The primary purpose of the LRDP is to guide the physical development of land and facilities and to provide a framework for implementing the Laboratory's mission and scientific goals. The proposed LRDP sets forth plans and policies that are intended to guide the physical development of the LBNL hill site, including the construction of new buildings, roads, parking lots, and infrastructure systems, while protecting significant natural resources at the site.

LBNL currently occupies and uses space on its main hill site, on the UC Berkeley campus, and in various leased locations in the cities of Berkeley, Oakland, Walnut Creek, and elsewhere. The proposed 2006 LRDP addresses continuing and projected uses and activities at all three of these areas. The baseline figures used in this document were established in July 2003.² Space area and square footage numbers used in this description include occupied buildings and associated mechanical structures; space figures do not include parking structures or electrical switch-gear structures.

Main Hill Site: Under the proposed LRDP, the total building area at the main LBNL hill site could increase from 1.76 million gross square feet (gsf) of occupiable space to as much as 2.42 million gsf of occupiable space, for an overall increase over the life of the LRDP of 660,000 net new gsf. This EIR analysis also analyzes parking structure options in various hill site locations – these are not included in the 660,000 gsf of net new occupiable space. The net total assumes demolition of up to 320,000 gsf of existing facilities during the term of the LRDP (of this total, approximately 50,000 gsf has already been demolished since July 2003, which is the baseline period for this analysis). Without factoring in demolition, the total anticipated project-related construction at the main hill site is estimated to be approximately 1.35 million gsf over the planning period, including 372,000 gsf of new parking structures.

For purposes of the analysis in this EIR, the maximum total of new construction and renovation is 1.35 million square feet. This includes 980,000 gsf of new occupiable building space (research and support space) construction, along with 372,000 gsf of new parking structures. While parking structures are not considered part of the occupiable space totals identified in the LRDP, they do account for potential construction-related impacts and are thus considered in the EIR analysis. When the projected demolition figure of 320,000 gsf is subtracted from the new occupiable building space total, the net amount of possible new construction under the LRDP – 660,000 net new gsf – is derived.

² Pursuant to the CEQA Guidelines (Section 15125(a)), the baseline date for environmental impact analysis is the date upon which the notice of preparation for this EIR was circulated. Due to the substantial time required to prepare this EIR, some of the activities have already been either approved or completed pursuant to the Laboratory's existing LRDP and appropriate CEQA compliance.

Readers should note that the scope of potential development on the main hill site has been reduced since the issuance of the Notice of Preparation for this EIR. The NOP anticipated a possible maximum of 1,240,000 gsf of new research and support space construction, and 440,000 gsf of demolition, leading to up to 800,000 net new gsf of occupiable space. Since the release of the NOP, however, it has become apparent to Lab staff that DOE funding priorities may limit the scope of development pursuant to the LRDP, and while it is possible that other funding sources may make up some of this difference, this reallocation of DOE priority is likely to decrease the amount of development on the main hill site. In addition, and more importantly, substantial concerns were raised by the City of Berkeley in a series of meetings regarding the amount of growth proposed on the main hill site. For both of these reasons, the Lab determined that the LRDP and the proposed project presented in this EIR should be reduced in scope to 980,000 gsf of new occupiable building space construction, with 320,000 gsf of demolition for a net total of 660,000 gsf of new occupiable space. This is a reduction of approximately 21 percent in the amount of possible new construction of occupiable space under the LRDP, and a reduction of 17.5 percent in the amount of possible net new occupiable space. Table I-1 summarizes this reduction in development potential, showing the total occupiable building space and adjusted daily population (ADP) proposed by the 2006 LRDP currently proposed as compared to the occupiable building space and ADP provided for by the LRDP that was originally proposed when the NOP was issued. Table I-2 shows the corresponding reduction in the number of parking spaces proposed for the main hill site under the currently proposed 2006 LRDP.

UC Berkeley Campus: Berkeley Lab has a long-standing history of use of approximately 100,000 net square feet (nsf) on the UC Berkeley campus. The LRDP does not project an increase in Berkeley Lab space beyond 100,000 nsf, but allows for reallocation of space into other buildings on the UC Berkeley campus.

Off-Site Leased Space: Currently, the Laboratory uses approximately 338,000 gsf of off-site commercial leased space for shipping, receiving and warehouse functions; administrative work in Washington D.C.; telecommute centers; and research projects that are site dependent and/or joint ventures with other laboratories. The LRDP anticipates that the Laboratory will continue to use off-site leased space for these purposes, though the amount and location of such space will change over time, depending on Laboratory needs and market conditions. However, for analysis in this EIR, the total amount of off-site leased space is not expected to substantially differ from the current level.

I.D.3 Project Variant

Berkeley Lab may decide during the course of the planning period to consolidate most of its personnel on the main hill site. Under this variant, only a few LBNL staff would work off-site, including warehouse staff and personnel based in Washington, D.C., for a total of approximately 25 people. Under the variant, new space developed on the main hill site would remain the same as under the proposed 2006 LRDP, although some administrative office space may be used more intensively, nor would the number of parking spaces provided to Laboratory employees be increased to accommodate this additional hill staff.

**TABLE I-1
ADJUSTED DAILY POPULATION AND TOTAL BUILDING SPACE
ORIGINALLY PROPOSED 2006 LRDP VS. CURRENTLY PROPOSED 2006 LRDP**

	Originally Proposed 2006 LRDP	Currently Proposed 2006 LRDP	Difference
Adjusted Daily Population (ADP)			
LBNL Hill Site	4,800	4,650	-150
UC Berkeley Campus	350	350	0
Leased Space ¹	375	375	0
Total Lab Population	5,525	5,375	-150
Total Building Space (gsf)			
LBNL Hill Site	2,560,000	2,420,000	-140,000
UCB Campus Space (nsf) ²	100,000	100,000	0
Leased Space ¹	338,000	338,000	0
Total Occupied Space	2,998,000	2,858,000	-140,000

gsf – gross square feet; nsf – net square feet

¹ “Leased space” includes the Lab’s warehouse in west Berkeley, and leased office and research space in downtown and other areas of Berkeley, downtown Oakland, Walnut Creek, and various other locations. See text.

² Space occupied by LBNL on the UC Berkeley campus is variable; the amount of space in the table is the maximum that LBNL uses.

**TABLE I-2
PROPOSED PARKING PROGRAM
ORIGINALLY PROPOSED 2006 LRDP VS. CURRENTLY PROPOSED 2006 LRDP**

	Originally Proposed 2006 LRDP	Currently Proposed 2006 LRDP	Difference
2003 Baseline Parking Spaces	2,300	2,300	0
2003 Baseline Adjusted Daily Population (ADP)	4,375	4,375	0
2003 Baseline ADP to Parking Ratio	1.9	1.9	0
Anticipated Additional Spaces	600	500	-100
Total Planned Spaces	2,900	2,800	-100
Future ADP	5,525	5,375	-150
Future ADP to Parking Ratio	1.9	1.9	0
2003 Baseline Parking Spaces	2,300	2,300	0
Spaces to be removed	(990)	(800)	190
New spaces to be added in lots	470	450	-20
New spaces added in structures	1,120	850	-270
Total spaces per plan	2,900	2,800	-100

I.D.4 Illustrative Development Scenario

The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. The Lab has developed the scenario to provide greater detail and more complete public disclosure of potential project impacts, and also to provide a basis for some of the quantified modeling that has been completed for the LRDP. The scenario is intended to provide a conservative basis for the analysis of environmental impacts. It is anticipated that actual development that would be approved and constructed pursuant to the 2006 LRDP would be less intense than portrayed in the scenario. In addition, the Illustrative Development Scenario was developed before the proposed 2006 LRDP was reduced in scope, as described in Section I.D.2 above, 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. At any particular building site, however, the level of development may approach the intensity of development that is included in the scenario (and portrayed in the analyses such as visual renditions that are based on the scenario), so the scenario remains an appropriate and conservative basis for evaluating the potential environmental impacts of development pursuant to the 2006 LRDP. Also, the actual locations of buildings, configurations, uses, and the like may vary as specific projects are considered and approved in the future.

I.E. Summary of Alternatives

This Draft EIR analyzes four alternatives to the proposed 2006 LRDP: a No Project Alternative (as required by CEQA), two reduced project alternatives, a preservation alternative, and an off-site alternative. Additionally, a Preservation Alternative and a No Growth Alternative were considered and rejected; the explanation is given in Chapter V.

I.F. California Environmental Quality Act Process

I.F.1 Organization of this Draft Environmental Impact Report

This EIR is organized to allow the reader to quickly review a summary of the analysis and recommended mitigation measures, and identify the residual environmental impacts after mitigation, if any (see Chapter II, Summary). Those readers who wish to read the Draft EIR in greater detail are directed to Chapter IV, Environmental Setting, Impacts, and Mitigation Measures.

The Draft EIR begins with this Introduction (Chapter I). The chapters following the Introduction are organized as follows:

Chapter II, Summary, describes the proposed project, issues of controversy associated with the project, environmental effects of the project, and alternatives to the project (including the No Project Alternative). The Summary includes Table II-1, Summary of Environmental Impacts and Mitigation Measures, which lists each identified environmental impact, corresponding mitigation measure(s), and residual level of significance following implementation of mitigation.

Chapter III, Project Description, provides a description of the project site and location, project objectives, proposed project characteristics, and an outline of the approval process.

Chapter IV, Environmental Setting, Impacts, and Mitigation Measures, contains an analysis of environmental topics. The discussion of each topic is divided into an *introductory paragraph* that describes the scope of the issue under consideration, a *Setting* section that describes baseline environmental information, an *Impacts and Mitigation Measures* section that sets forth general standards of significance for potential impacts and describes the project-specific impacts and mitigation measures, and a *Cumulative Impacts* section that describes the cumulative impacts, if any, of the proposed project, in conjunction with other applicable projects.

Chapter V, Alternatives, provides an analysis of a reasonable range of alternatives to the proposed project. As required by the CEQA Guidelines, a discussion of the reasons for selecting the alternatives analyzed in this chapter is provided, along with a comparative analysis of each alternative and identification of the “environmentally superior” alternative.

Chapter VI, CEQA Considerations, reviews the significant, irreversible effects (if any) and cumulative impacts identified in Chapter IV.

Chapter VII, Report Preparation, lists the firms and staff members that prepared the Draft EIR, as well as persons and agencies contacted during preparation of the Draft EIR.

Chapter VIII, Bibliography, provides a list of documents cited in the EIR.

Chapter IX, Acronyms, presents a list of acronyms and abbreviations used in the EIR.

The **Appendices** present the background data and technical information used in support of the impact analyses provided in the EIR.

I.F.2 Environmental Review Process

On October 28, 2003, LBNL issued a Notice of Preparation (NOP) to governmental agencies, organizations, and interested persons for the 2006 LRDP. The NOP is included as an appendix to this EIR, as are comments on the scope of the EIR received in response to the NOP, and comments on the proposed content of the EIR received at a public scoping meeting held at the North Berkeley Senior Center on November 17, 2003. Comments received regarding the proposed content of the EIR are addressed in this Draft EIR. A transcript from that meeting is included in Appendix A.

This Draft EIR will be published and circulated for review and comment by the public and other interested parties, agencies, and organizations for a 60-day period. **The public review period will be from January 22, 2007 to March 23, 2007. A public hearing on the Draft EIR will be held from 6:30 p.m. to 9:30 p.m. on Monday, February 26, 2007, at the North Berkeley Senior Center. The North Berkeley Senior Center is located at 1901 Hearst Avenue in Berkeley.**

The public is invited to attend the hearing and to offer comments on the Draft EIR. All comments or questions about the Draft EIR should be addressed to:

Jeff Philliber
Environmental Planning Group
Lawrence Berkeley National Laboratory
One Cyclotron Road, MS 90J-0120
Berkeley, CA 94720

Comments may also be sent by e-mail to: lrddp-eir@lbl.gov (attention: Jeff Philliber).

The 2006 LRDP and this Draft EIR are also publicly available at www.lbl.gov/lrddp (for the duration of this CEQA process) and also at the following locations:

Berkeley Lab Main Library
One Cyclotron Road
Building 50, Room 4034
Berkeley, CA 94720

Berkeley Public Library
2090 Kittredge Street
2nd Floor, Reference Desk
Berkeley, CA 94704

Following the public review period, responses to all substantive comments received on the adequacy of the Draft EIR and submitted within the specified review period will be prepared and included in the Final EIR. The Regents will then review and consider the Final EIR prior to any decision to approve, revise and approve, or reject the proposed project. Prior to approval of the proposed project by The Regents, the University must certify the Final EIR as complete and adequate and adopt a Mitigation Monitoring Program. Project requirements and required mitigation measures identified in the EIR and Mitigation Monitoring Program adopted by The Regents shall be implemented by LBNL.

I.F.3 Evaluation of Local Plans and Zoning in this EIR

The State of California and its constitutionally created agencies are generally exempt from a city's planning and zoning regulations. Specifically, the University of California was established by Article IX, Section 9 of the California Constitution. Section 9 grants the UC Regents broad authority with respect to the management and disposition of its property: "The Regents of [UC] . . . shall have the power to take and hold . . . without restriction, all real and personal property for the benefit of the university or incidentally to its conduct." CAL. CONST. Art. IX, Section 9(f). Because the Lab is operated by the UC on UC land for UC purposes, it is exempt from local zoning regulations pursuant to its Section 9 grant of sovereignty.

LBNL is a federal facility conducting work within the University of California's mission and as such is generally exempted by the federal and state constitutions from compliance with local land use regulations, including general plans and zoning. However, LBNL seeks to cooperate with local jurisdictions to reduce any physical consequences of potential land use conflicts to the extent feasible.

The CEQA Guidelines (Section 15125(d)) specify that an EIR shall discuss “any inconsistencies between the proposed project and applicable general plans and regional plans.” The general plans of the Cities of Berkeley and Oakland are not “applicable” plans, because UC is legally exempt from such plans and those plans do not apply to the conduct of university activities on UC property. In addition, the conduct of federal activity is not subject to such local plans. Nevertheless, for purposes of public disclosure this EIR at appropriate points does summarize the provisions of local land use plans for CEQA purposes. Also, Section 3.14 of the UC CEQA Guidelines states that UC will seek to cooperate to minimize conflict with local plans where feasible to do so.

I.F.4 Relationship Between this EIR and CEQA Review for Later Project Approvals Pursuant to the LRDP

The 2006 LRDP is a land use plan that guides the physical development of the LBNL main site. It is not an implementation plan, and adoption of the LRDP does not constitute a commitment to any specific project, construction schedule, or funding priority. Rather, it describes the entire development program including construction of approximately 660,000 net new occupiable gsf for the site through 2025. The 2006 LRDP EIR is a program-level EIR that evaluates the effects of implementation of the entire LRDP. Any proposal for future development at LBNL must be approved by the LBNL Director, by the President of the University of California, or The Regents, as appropriate, and comply with CEQA.

Additional future LBNL projects proposed for implementation under the 2006 LRDP would be evaluated to determine whether the LRDP EIR has fully analyzed the project impacts, or whether additional CEQA review is necessary.

As a program CEQA document, the LRDP EIR sets standards of significance for environmental impacts and evaluates whether construction and operation of Berkeley Lab through 2025 would exceed these standards. Under CEQA guidelines for using program EIRs with later activities, if the proposed activities do not have effects that were not examined in the previous program EIR, and no new or substantially more severe significant effects would occur and no new mitigation measures would be required, a program EIR has adequately analyzed the later activities for CEQA purposes; i.e., the later activities are within the scope of the program EIR, and no further review under CEQA is required.

Use of program EIRs to cover later activities is addressed in CEQA Guidelines Section 15168(c):

- (c) Use with Later Activities. Subsequent activities in the program must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared.
 - (1) If a later activity would have effects that were not examined in the program EIR, a new Initial Study would need to be prepared leading to either an EIR or a Negative Declaration.

- (2) If the agency finds that pursuant to Section 15162, no new effects could occur or no new mitigation measures would be required, the agency can approve the activity as being within the scope of the project covered by the program EIR, and no new environmental document would be required.
- (3) An agency shall incorporate feasible mitigation measures and alternatives developed in the program EIR into subsequent actions in the program.
- (4) Where the subsequent activities involve site specific operations, the agency should use a written checklist or similar device to document the evaluation of the site and the activity to determine whether the environmental effects of the operation were covered in the program EIR.
- (5) A program EIR will be most helpful in dealing with subsequent activities if it deals with the effects of the program as specifically and comprehensively as possible. With a good and detailed analysis of the program, many subsequent activities could be found to be within the scope of the project described in the program EIR, and no further environmental documents would be required.

Like many other CEQA Guidelines sections, Section 15168 includes interpretive “discussion” that has been prepared by the Governor’s Office of Planning and Research in connection with the promulgation of the Guidelines. This interpretive discussion is considered an advisory aid in interpreting the Guidelines. The discussion that accompanies CEQA Guidelines Section 15168 indicates that the use of program EIRs to cover later activities is favored under CEQA when such EIRs fulfill the conditions set forth in Section 15168:

Use of the program EIR also enables the Lead Agency to characterize the overall program as the project being approved at that time. Following this approach when individual activities within the program are proposed, the agency would be required to examine the individual activities to determine whether their effects were fully analyzed in the program EIR. If the activities would have no effects beyond those analyzed in the program EIR, the agency could assert that the activities are merely part of the program which had been approved earlier, and no further CEQA compliance would be required. This approach offers many possibilities for agencies to reduce their costs of CEQA compliance and still achieve high levels of environmental protection.

Future activities at LBNL that would be implemented under the LRDP will be examined by the Lab under this program EIR to determine whether additional CEQA documentation must be prepared. As provided under CEQA Guidelines Sections 15162 and 15168, if the Lab finds, among other things, that no new effects would occur as a result of the project beyond what is evaluated in this EIR and that no new mitigation measures would be required, the Lab could approve the activity as being within the scope of the project covered by this EIR, and no new environmental documentation would be needed. As outlined in Guidelines Section 15164, if the above conditions apply, but some changes or additions to the EIR are necessary, an addendum to the EIR could be prepared. If these conditions do not apply—for example, if the Lab finds that a later activity would have effects that were not examined in the EIR—a new Initial Study and/or an EIR may have to be prepared. Also, for projects that require additional CEQA review and documentation before approval, this EIR may be used as a first-tier document pursuant to CEQA Guidelines Section 15152. In some circumstances (Guidelines Sections 15300 et seq.), a future

activity may be subject to a specific exemption from CEQA. The Lab will use a written checklist or similar device to document the evaluation of the activity to determine whether the environmental effects of the operation are covered in the EIR.

Review of future projects is subject to two additional restrictions, both of which are primarily the result of consultations with the City of Berkeley regarding overall growth at the Lab and traffic impacts of such growth. The first restriction is consistent with the reduced scope of the LRDP and the proposed project as described in this EIR. The proposed LRDP was reduced from an initial proposal, reflected in the Notice of Preparation, for 1,240,000 gross square feet of new research and support space construction and 440,000 square feet of demolition for a total of 800,000 square feet of net new occupiable space, to the currently proposed LRDP which consists of 980,000 gross square feet of new research and support space construction and 320,000 square feet of demolition, for a total of 660,000 gross square feet of new occupiable space. Accordingly, any development in excess of a net total of 980,000 gross square feet of new occupiable (research and support) space construction or 320,000 gross square feet of demolition would require an amendment of the LRDP and accompanying CEQA review. Absent such an amendment and the accompanying additional CEQA review, this EIR will not be used as a first-tier EIR for, or to reduce or streamline the subsequent CEQA processing of, any project that, when added to other construction pursuant to the LRDP, exceeds a net total of 980,000 gross square feet of new research and support space construction or 320,000 gross square feet of demolition.

Second, pursuant to a “reopener” that has been negotiated with the City of Berkeley, an updated traffic analysis will be prepared, on the earliest to occur of ten years from the date that this EIR is certified or the date upon which development at the Lab pursuant to the LRDP reaches 375 net new parking spaces. This updated traffic analysis will be prepared as part of an overall transportation demand management (TDM) program that has been developed in consultation with the City of Berkeley. Implementation of that TDM program is included in this EIR as a recommended mitigation measure for traffic impacts. When the earliest of these thresholds is reached, the Lab will conduct a new traffic study, consult with the City of Berkeley regarding the results of that study, and consider whether further mitigation measures or modification to the LRDP should be adopted based upon that traffic study. For example, when the Lab begins the CEQA review for a project that would result in the construction of parking spaces that would cause the Lab to exceed 375 net new spaces, the Lab would conduct an overall traffic study prior to the approval of that project’s CEQA document. Alternatively, the Lab may initiate a free-standing traffic study ten years after this EIR is certified. Thus, the further traffic study may be conducted as a part of a further project review or as an independent, free-standing study. If this traffic study indicates that the traffic analysis and mitigation in this EIR are still appropriate for the review of future projects, then the Lab will continue to rely upon the traffic analysis in this EIR as a first-tier analysis of traffic impacts. If this traffic study indicates that further mitigation is required, then the addition of that recommended mitigation will be considered by the Lab in consultation with the City of Berkeley.

CHAPTER II

Summary

This summary presents an overview of the analysis contained in Chapter IV: Environmental Setting, Impacts, and Mitigation Measures. This chapter summarizes the following: 1) areas of controversy; 2) project impacts; and 3) mitigation measures for significant impacts. Alternatives to the project are analyzed in Chapter V.

2.1 Project Description

This EIR evaluates the adoption and implementation of the proposed Lawrence Berkeley National Laboratory 2006 Long Range Development Plan (2006 LRDP; also referred to herein as the CEQA “project”) through a horizon year of 2025. Lawrence Berkeley National Laboratory (LBNL; also referred to herein as the “Lab,” “Berkeley Lab,” and “Laboratory”) occupies 202 acres in the Oakland/Berkeley hills, on what is referred to in the EIR as the Lab’s main “hill site.” The proposed LRDP provides for construction of approximately 980,000 gross square feet (gsf) of additional research and support space, approximately 585,000 square feet of parking space (of which an estimated 372,000 square feet [64 percent] would be in parking structures for a net gain of 500 new parking spaces), and demolition of up to 320,000 gsf of building space that is or may become obsolete or that poses safety hazards.¹ Up to 600,000 gsf of renovation may take place to restore or rehabilitate existing buildings.

The scope of the proposed 2006 LRDP and the amount of potential development under that LRDP have been reduced since the issuance of the Notice of Preparation for this EIR. The NOP anticipated a possible maximum of 1,240,000 gsf of new research and support space construction, and 440,000 gsf of demolition, leading to up to 800,000 net new gsf of occupiable space. Since the release of the NOP, however, it has become apparent to Lab staff that U.S. Department of Energy (DOE) funding priorities may limit the scope of development pursuant to the LRDP, and while it is possible that other funding sources may make up some of this difference, this reallocation of DOE priority is likely to decrease the amount of development on the main hill site. In addition, and more importantly, substantial concerns were raised by the City of Berkeley in a series of meetings regarding the amount of growth proposed under the LRDP. For both of these reasons, the Lab determined that the LRDP and the proposed project presented in this EIR should be reduced in scope to 980,000 gsf of new occupiable building space construction, with 320,000 gsf of demolition, for a net total of 660,000 gsf of new occupiable space. This is a reduction of

¹ Of the total of 320,000 gsf, approximately 50,000 gsf has already been demolished under the existing LRDP 1987 LRDP since the July 2003 baseline date for this document and approximately 270,000 gsf is projected to be demolished over the term of the approved LRDP.

approximately 21 percent in the amount of possible new construction of occupiable space under the LRDP, and a reduction of 17.5 percent in the amount of possible net new occupiable space.

LBNL may attempt to consolidate most of its staff and operations on its main hill site. A “project variant,” in which most of LBNL’s off-site staff would be moved onto the main hill site during the planning period, is analyzed in this EIR concurrent with the analysis of the 2006 LRDP.

The LRDP contains descriptions of Berkeley Lab science and technology goals and development principles for site and facilities development. In addition, a separate, companion document, the Berkeley Lab Design Guidelines, will provide direction for physical development under the 2006 LRDP. These Design Guidelines are proposed to be adopted by the Lab following The Regents approval of the LRDP.

The University of California is exempt under Article 9, Section 9 of the State Constitution from local planning, zoning, and redevelopment regulations whenever land under its control is used for purposes within its mission. As a federal facility—a U.S. Department of Energy National Laboratory—Lawrence Berkeley National Laboratory is also exempt from local planning, zoning, and redevelopment regulations.

2.1.1 Baseline Site Conditions and Characteristics

The LBNL site is a developed area that lies between UC Berkeley and residential neighborhoods of the City of Berkeley to the west and northwest. Although developed, the LBNL site retains substantial vegetation and natural topographic features. Approximately one-third of the LBNL site is covered by impervious surfaces, including buildings, roads, and parking lots, while the remaining two-thirds of the site is pervious or otherwise not paved. Berkeley Lab is fenced for security and controlled access.

The main hill site is owned by The Board of Regents of the University of California (“The Regents” or “UC Regents”). Building parcels on the Lab’s hill site are leased by the University to the U.S. Department of Energy (DOE) for all major DOE constructed buildings. The DOE owns most of the facilities and structures within LBNL and contracts out the management and operation of the National Laboratory to the University. The Lab also occupies approximately 100,000 square feet of off-site space at the UC Berkeley campus and approximately 338,000 gsf of other off-site leased spaces, mostly in Berkeley, Oakland, and Walnut Creek. (The UC Regents also own the Lab-occupied land at UC Berkeley; other off-site space is leased from private landowners.) Under the proposed LRDP, no substantial growth of either lab-occupied space on the UC Berkeley campus or of commercial lease space is planned, although the campus buildings occupied and off-site locations leased may change over time.

LBNL’s research and support activities are conducted in structures occupying a total of 2.2 million square feet, of which approximately 1.76 million square feet are located on the main hill site. The hill site has more than 150 buildings, many originally built as “temporary” single-purpose structures, more than 60 percent of which are more than 40 years old.

Under baseline (2003) conditions, LBNL employed approximately 3,800 people, including about 1,400 scientists and engineers, 500 administrative staff, and 1,900 technical and support staff. An estimated 2,500 guest researchers visit LBNL each year. This translates into an adjusted daily population (ADP)² of approximately 4,375. Of this total, some 4,000 are on the main hill site and in laboratory space on the UC Berkeley campus.³ Research staff in leased space in downtown Oakland and in Walnut Creek constitute an ADP of approximately 100 (about 50 at each location), and administrative staff in leased office space in downtown Berkeley constitute an ADP of about 225. About 50 ADP represent research staff who work in other remote locations.

Vehicular access to the main hill site occurs primarily along two routes: Hearst Avenue and Centennial Drive. These roadways provide access to three controlled points of entry (Blackberry Canyon Gate on Cyclotron Road, Strawberry Canyon Gate on Centennial Drive, and Grizzly Peak Gate on Centennial Drive), all of which are staffed by security personnel. Additional pedestrian access is provided through additional pedestrian-only gates. Circulation within the Lab site is primarily via two east-west roadways and connecting north-south roadways (Chamberlain Road and McMillan Road make up the primary “upper route” and Lawrence and Alvarez Roads form the “lower route”). Accompanying pathways and a series of connecting roadways, paths, stairways, and elevators allow staff and visitors to move among the Lab’s buildings. The main hill site provides approximately 2,300 permit parking spaces to qualifying Lab personnel and guests. LBNL operates a free shuttle service for employees and visitors both on the hill site and off-site between LBNL, UC Berkeley, the downtown Berkeley and Rockridge BART stations, and AC Transit.

The Laboratory’s principal role for the DOE is to promote fundamental science, including developing powerful experimental and computational systems for exploring properties of matter, deepening understanding of molecular interactions and synthesis, and gaining insights into biological molecules, cells, and tissues. The Laboratory is a major contributor of research on energy resources, including efficient energy use, the earth’s structure and energy reservoirs, fusion, and cleaner combustion of fuels, as well as environmental research, subsurface contaminant transport, bioremediation, and indoor air quality. Research programs include computational research, information technologies, chemical sciences, materials sciences, physical biosciences, earth sciences, life sciences, accelerator and fusion research, nuclear science, and basic physics. User facilities include the Advanced Light Source, National Energy Research Scientific Computing Center, National Center for Electron Microscopy, and Energy Sciences Network (ESnet). The Laboratory’s multidisciplinary research environment and unique location serve to strengthen partnerships with industry, universities, and government laboratories. Partnerships include the Joint Genome Institute and programs in advanced accelerator and detector systems, x-ray lithography, high-speed networking and computer architectures, building and lighting systems, and science education.

² ADP represents the actual number of people at the Laboratory’s main hill site, in Berkeley Lab space on the UC Berkeley campus, and in leased facilities on any given day. It is calculated by combining the Lab’s full-time-equivalent employment (about 3,400) with approximately 40 percent of the annual average number of guests.

³ Under baseline conditions, about 3,650 ADP are on the main hill site and about 350 ADP are on the UC Berkeley campus. Many LBNL staff working at UC Berkeley hold “joint appointments” at both institutions.

2.1.2 Changes in Baseline Conditions Since 2003

LBNL issued the Notice of Preparation (NOP) for the proposed LRDP on October 28, 2003, and therefore this EIR uses 2003 as the baseline year for evaluating the project's impacts on its environmental setting. To provide a conservative analysis, however, this EIR selectively uses more recent (post-2003) data, where appropriate and where using such data does not make the analysis less conservative. Since the NOP was issued, the Lab's ADP peaked at approximately 4,650 in 2004 and has since declined to about 4,515 in 2006. This short-term change in ADP is considered to be a part of the normal fluctuation in the Lab's population cycle and, for purposes of impact analysis, has not resulted in a meaningful change, compared with the 2003 baseline setting.

Also since the NOP was issued, the Lab has considered a number of building projects that, for purposes of this EIR, are included as part of the 2006 LRDP "project." The Molecular Foundry was approved and has been constructed and began preliminary operations in early 2006.⁴ Although operational, the Molecular Foundry is included as part of the 2006 LRDP "project" that is analyzed in this EIR, because the building was not operating when the EIR analysis was begun in 2003. Berkeley Lab has also approved construction of the Animal Care Facility, a 7,100-gross-square-foot structure that will house mice used in research. Construction of this project is under way and is expected to be complete in 2007. In addition, certification of an EIR and approval of the demolition of Building 51 (the Bevatron) are anticipated to be considered in early 2007; the Building 51 complex is considered part of the baseline setting for this EIR, however, because the buildings were in place when the EIR analysis was begun. Therefore, demolition of Building 51, although the subject of a separate project-specific EIR, is analyzed as part of the 2006 LRDP. Building space for two other planned projects under consideration – the Guest House and the User Support Building – is also included as part of the 2006 LRDP evaluated in this EIR. However, it is anticipated that these projects will undergo separate CEQA analysis pursuant to the 1987 LRDP and the 1987 LRDP EIR, as amended. In addition, two additional projects anticipated to be considered in the future pursuant to the 2006 LRDP EIR are included as part of the reasonably foreseeable future development that is evaluated in this EIR. These projects are the Computational Research and Theory (CRT) Building and the Helios Research Facility. The CRT Building would likely be a six-story, 165,000-gross-square-foot building for high-end computing near the Blackberry Canyon Gate. The Helios facility would likely be proposed as a four-story, 100,000-gross-square-foot laboratory building constructed south of existing LBNL Buildings 66 and 62 or in a location west of Buildings 72 and 67.

2.1.3 Project Objectives

The proposed 2006 LRDP outlines the following approach to revitalizing the facilities and infrastructure at the main site:

- Strengthen and expand existing research programs to sustain and grow Berkeley Lab's role as a national research institution;

⁴ The Molecular Foundry was approved pursuant to the Lab's existing 1987 LRDP and 1987 LRDP EIR, as amended; a project-specific Negative Declaration was also completed.

- Expand partnerships and collaborations to enhance Berkeley Lab's scientific and technical base;
- Provide flexibility to return staff from its off-site facilities leased in Berkeley and Oakland to the main site in order to enhance collaboration, productivity, and efficiency;
- Expand the capacity of existing high-demand advanced facilities and provide broader functionality;
- Rehabilitate facilities that have outlived their intended purpose and can be cost-effectively adapted for use in new regions of scientific discovery;
- Replace single-purpose facilities with new facilities programmed to accommodate multiple disciplines with advanced infrastructure suitable for future scientific endeavors; and
- Construct new scientific facilities to support future research initiatives and continued growth in existing programs.

The 2006 LRDP also includes a number of principles and strategies intended to guide future development at the Lab. As already noted, a separate, companion document, the Berkeley Lab Design Guidelines, will provide direction for physical development under the 2006 LRDP. These proposed Design Guidelines are proposed to be adopted by the Lab following The Regents approval of the LRDP. These principles, strategies, and design guidelines are listed in Appendix B and are referred to in the Project Description and the various technical sections of this EIR, as appropriate.

2.1.4 Proposed Project

The proposed 2006 LRDP is a new plan that would replace the existing 1987 LRDP, as amended, and address continuing and projected uses and activities at the main LBNL site, at space on the UC Berkeley campus, and at off-site leased locations, assuming a horizon year of 2025. Under the proposed LRDP, the total research and support space building area at the main LBNL hill site would increase to as much as 2.42 million square feet, and the ADP would increase from 4,375 to 5,375 (see Table S-1).

2.1.4.1 Land Use Plan

The 2006 LRDP includes a Land Use Plan that would establish four land use zones for the Lab's hill site. In conjunction with the LBNL Design Guidelines and land use objectives and with avoidance of fixed land use constraints (such as important habitat or seismic zones), the Land Use Plan would guide siting decisions for future buildings and support facilities. The four proposed land use zones are (1) Research and Academic, (2) Central Commons, (3) Support Services, and (4) Perimeter Open Space.

The Research and Academic zone would include approximately 121 acres, largely encompassing or adjacent to already developed portions of the main hill site. Within this area all typical Lab research facilities as well as supporting uses such as parking, circulation and administrative uses would be located. Research space would include laboratories, offices, and specially outfitted

**TABLE S-1
BASELINE AND FUTURE POPULATION AND SPACE PROJECTIONS (approx.)**

	Baseline (2003)	Future (2025)	Change (2025)
Adjusted Daily Population (ADP)			
LBNL Hill Site	3,650	4,650	+1,000
UC Berkeley Campus	350	350	0
Leased Space ¹	375	375	0
Total Lab Population	4,375	5,375	+1,000
Building Space (gsf)			
LBNL Hill Site	1,760,000	2,420,000	+660,000 ²
UCB Campus Space (nsf) ³	100,000	100,000	0
Leased Space ¹	338,000	338,000	0
Total Occupied Space	2,198,000	2,858,000	660,000

gsf – gross square feet; nsf – net square feet

- ¹ “Leased space” includes the Lab’s warehouse in west Berkeley, and leased office and research space in downtown and other areas of Berkeley, downtown Oakland, Walnut Creek, and various other locations. See text above.
- ² Change in building space is net value:320,000 gsf of demolished space subtracted from overall space construction figure of980,000 gsf would result in 660,000 gsf of new space. Two projects—the Molecular Foundry and Building 49—have been approved under the 1987 LRDP and LRDP EIR. The Molecular Foundry has since been constructed, but Building 49 is indefinitely on hold. For purposes of analysis, the Molecular Foundry—approximately 95,000 gsf—is counted as part of the project to be developed and not as part of the baseline setting.
- ³ Space occupied by LBNL on the UC Berkeley campus is variable; the amount of space in the table is the maximum that LBNL uses.

areas such as accelerator facilities. Research space would also include associated support activity. Under the LRDP, priority would be given to siting new facilities where service infrastructure and roads are in place.

As a subset of the Research and Academic zone, the Central Commons would be the main location of dining and gathering uses, as well as visitor accommodations. This approximately six-acre “heart” of the Lab would be the hill site’s primary gathering and event area.

The Support Services zone (19 acres) would provide a central location for the Lab’s support functions, such as shops, environmental services, corporation yards, and maintenance. Facilities maintenance and other operations and logistical spaces would provide for operating, maintaining, and repairing the Lab’s buildings and grounds.

The 56-acre Perimeter Open Space land use zone would encompass the remaining areas of the Lab’s hill site and indicate areas of the Lab where future development would be primarily reserved for minor maintenance or support structures or paths and where the open, wooded, or grassland character of the hillside site would be retained to the extent feasible. Much of the Perimeter Open Space zone would comprise parts of the site where development potential is restricted due to constraints such as habitat quality and vegetation, seismic risk, utility easements, adjacent uses, and similar limitations. Throughout these areas various maintenance activities would continue to preserve and enhance appropriate vegetation characteristics.

The LRDP calls for developing clusters of research and academic uses close to one another and creating usable, attractive plazas and other open spaces that would function as “commons” for nearby buildings. This clustering of development would allow the Lab to evolve into a more campus-like setting, fostering interaction and informal encounters among Lab staff and supporting the “team science” heritage of the Lab.

2.1.4.2 Transportation, Circulation, and Parking

Several circulation improvements are planned to improve vehicular access while minimizing potential pedestrian-vehicular conflicts. Improvements are planned for the major Lab circulation routes to allow two-way traffic on Chamberlain Road and other routes, including widening and the removal of some roadside parking. A new north-south roadway is proposed east of the Advanced Light Source (Building 6) to more efficiently connect the Lab’s two primary east-west roadways. Improvements to the intersection of Glaser and Lawrence Roads are proposed to similarly enhance north-south circulation and improve safety. Improvements to the existing Blackberry Canyon Gate and Strawberry Canyon Gate would provide for longer queuing lanes, new guard houses, and improved signage and landscaping. Additional improvements would include development of a new service access road, a new service access gate planned off Centennial Drive, and improved emergency access and egress.

Bicycle access would continue to be provided on the major and minor roads. Where feasible, bicycle lanes would be provided; in most cases bicycles would share the roadway with cars and trucks, as the moderate speeds dictated by the hill site are suitable to bicycle and vehicle use of the roads. Bicycle parking would be located at building entries and/or at the edges of outdoor open spaces centered in building clusters.

The 2006 LRDP includes a Pedestrian Circulation Plan that illustrates planned improvements to the pedestrian network and identifies the relationship of this network to the shuttle system and the commons areas. Pedestrian paths would be improved or added, in particular where they would reinforce important connections between and within the research clusters.

Under the 2006 LRDP, parking on the hill site would increase by approximately 500 net new spaces for a total of 2,800 parking spaces. However, the ratio of adjusted daily population to parking spaces would not increase over the life of the Plan. Two new parking structures are proposed to be located near the Lab gates and several mid-sized parking lots would be created, primarily on sites of buildings to be demolished. These lots and structures would consolidate parking spaces removed from roadsides, service areas, the interiors of research clusters, and building sites. Consolidating the parking closer to the gates would be expected to reduce auto circulation within the Lab, creating a more pedestrian-friendly environment, and would also reduce the parking-related impervious surface area at the Lab by concentrating parking in multi-story structures that occupy less ground area per parking space than do surface lots.

2.1.4.3 Open Space Plan

Under the 2006 LRDP, a substantial portion of the Lab main hill site would be designated as Perimeter Open Space. This land use zone would encompass areas set aside due to constraints that require that minimal intrusion or activity occur, and other areas that are intended to remain primarily as open space because they enhance the visual image of the Lab from within and outside the site. Perimeter Open Space would consist of 56 acres, or 28 percent of the 202 acres on the main hill site. These areas around the periphery of the Lab are proposed to be maintained primarily as they currently exist, due to their important biological, aesthetic, or other characteristics.

Within the zones where research facilities are currently located, and where future research facilities would be focused, there is a wide variety of open space conditions. Due to the hilly nature of the Lab site, spaces between development clusters, and even between buildings, may function as open space. These spaces are usually rustic in character with trees and a variety of grasses or shrubs. These areas would be maintained in their natural states. In a limited number of cases it may be necessary to re-grade or reshape these areas to facilitate the siting of a future research facility. In such cases, efforts would be made to retain and/or replace trees and other elements that contribute to the open space character of the Lab site.

As part of the LRDP's aim of strengthening the Lab's campus-like form, most new buildings would be located on infill sites and/or adjacent to existing facilities, resulting in a higher density of development within each cluster and retention of more undeveloped space between clusters. Outdoor spaces for pedestrian uses would be located toward the center of the clusters, in spaces formally defined by the edges of new and existing buildings. The specific configuration and design of new development within the clusters would be guided by illustrative plans and by the LBNL Design Guidelines that, while separate from the LRDP, would support the Lab's objectives and address specific design of outdoor spaces and buildings.

At present, the areas most central to the research clusters are typically parking lots, are occupied by temporary facilities (many of which have been in place for many years), or consist of roads or service areas. As proposed under the 2006 LRDP, a large percentage of existing parking and service areas would be relocated, allowing for reconfiguration of the research clusters to function more efficiently and to be connected to one another by pedestrian paths. In addition, improvements to roads would be made to accommodate transit stops, bicycle parking, pedestrian sidewalks, and other amenities to support the Lab's transportation demand management efforts. The intent of the LRDP is to create a usable outdoor space, such as a plaza, within each cluster. These outdoor spaces would be scaled to be appropriate for the cluster of facilities, with amenities to encourage informal use.

2.1.4.4 Landscape and Vegetation Management

While additional research facilities would be added to the Lab in coming years, the hill site is anticipated to retain a strong sense of open space and landscape. The 2006 LRDP includes plans to reinforce this natural appearance, both from outside views as well as from views within the

site. The Land Use Plan identifies areas of the campus that would remain undeveloped, and the proposed Landscape Framework further defines the ways in which these various open spaces would be planted and otherwise improved. The 2006 LRDP Landscape Framework identifies five key categories of landscape: (1) Rustic, (2) Rustic Riparian, (3) Screening, (4) Ornamental, and (5) Significant Ornamental. Each area would be landscaped or maintained differently.

The vast majority of the Lab site is characterized by the rustic, diverse landscape mosaic of oak and mixed hardwood forests, native and non-native grasslands, chaparral, coastal scrub, marsh and wetland communities, and riparian scrubs and forests that would be retained in their naturalistic state. Maintenance activities in the rustic zones would be undertaken to maintain the health of these areas. Pedestrian paths would be carefully aligned through these areas, but in general most Lab activities would not occur in these zones.

Several riparian environments that occur on the hill site have significant habitat value. These rustic riparian environments would be protected from development, with only maintenance activities permitted.

Existing or proposed stands of screening trees would obscure views of Lab buildings. Important stands of trees that currently screen Lab buildings from view from the surrounding community would be maintained, and additional screening would be added where it can help maintain the distinctive character of the site. Screening trees would also be added within the main site along Centennial Drive, which passes alongside the Lab.

As the common areas within the clusters of research uses are reconfigured to provide more usable outdoor areas, ornamental landscaping would be used to reinforce their attractiveness through the use of color, texture, and visual interest. In particular the Central Commons, the primary gathering space of the Lab, would be landscaped and furnished to provide a diversity of usable outdoor environments for special events. At the highest activity pedestrian areas – the Central Commons and secondary commons spaces – special plantings can be used to heighten visual interest.

The developed areas of the Lab correspond to the research clusters, support areas and parking lots and are currently landscaped with a variety of plant materials. Within the developed portions of the site, where high levels of pedestrian activity occur, ornamental landscapes would be used to add color, visual interest, and other amenities. This strategy would be continued as aging or outdated facilities are removed and new ones are added.

As described in the 2006 LRDP, the Laboratory is a campus-like setting maintained in a manner similar to a research park. Continuous improvements in landscaping for both developed and undeveloped areas of the Lab are anticipated under the 2006 LRDP. This landscape management approach is consistent with the Laboratory's fire-safe vegetation management measures that annually remove tree limbs a minimum of six to eight feet from the ground, mow or allow grazing of grasses, remove brush from most vegetated areas of the site, and plant ornamental species near buildings for fire safety. Berkeley Lab's existing vegetation management would

continue under the 2006 LRDP.⁵ The Lab's vegetation management program would continue to encourage native plants and removal of invasive exotic plants, including French broom, artichoke thistle, Cape ivy, and pampas grass. Eucalyptus and other non-native tree stands across the site would continue to be removed or thinned.

2.1.4.5 Infrastructure and Utilities

The 2006 LRDP foresees improvements to Berkeley Lab's infrastructure to increase reliability, flexibility, and efficiency, and to increase redundancy in the provision of critical services and utilities. Included among the LRDP's Development Principles is an intention to locate upgraded and new service lines in corridors.

Utility upgrades would include projects to improve water, natural gas, electrical, sanitary sewer, storm sewer, and compressed air utility infrastructure. During the past approximately 20 years, LBNL has replaced, re-lined, or re-routed approximately half of its sanitary sewer pipes. Under the 2006 LRDP, the Lab would also continue replacing aging sanitary sewer infrastructure to reduce stormwater infiltration during wet weather conditions. The Strawberry Monitoring Station would be upgraded and the Centennial Drive sewer main from the Life Sciences area would be replaced. Additionally, LBNL would continue working with UC Berkeley and the City of Berkeley to identify a feasible solution to accommodate increased effluent on the Strawberry Outfall due to project-related growth. LBNL has completed a study reviewing four options to divert LBNL-related sanitary sewer flows around problematic sewer lines in Berkeley.

The LRDP is consistent with the University's Presidential Policy for Green Building Design and Clean Energy Standards, adopted in July 2003 (amended October 24, 2003), which seeks to minimize the University's impact on the environment and to reduce the University's dependence on non-renewable energy. The policy is based on the Leadership in Energy and Environmental Design (LEED) rating system promulgated by the U.S. Green Building Council. Berkeley Lab will design and build all new buildings to meet the LEED "certified" rating, at a minimum, and will strive to meet the higher "silver" rating with additional sustainability features proven to be lifecycle cost-effective. The LRDP states that Berkeley Lab will develop a sustainability strategy integrating the Lab's site, climate, and infrastructure-intensive facilities to achieve the most sustainable facility practicable.

2.1.5 Project Variant

The project variant is analyzed in the event that Berkeley Lab management decides during the course of the planning period to consolidate most of its personnel on the main hill site. Under this scenario, up to approximately 350 employees currently working off-site would be transferred to the main hill site and approximately 25 LBNL staff would continue to work off of the Lab's main hill site or the UC Berkeley campus.

⁵ Three biologically sensitive areas of the Laboratory have been identified as low fire risk, and are not managed on an annual basis. However, to preserve trees, brush and grasses on the perimeter of these areas are managed annually.

2.1.6 Conceptual Portrayal of Potential Development: Illustrative Development Scenario

For purposes of describing specific physical impacts that could reasonably be expected to occur as a result of development anticipated pursuant to the LRDP, this EIR evaluates an Illustrative Development Scenario, which represents a reasonable outcome of LRDP implementation. The Illustrative Development Scenario (see Figure III-9 in Chapter III) is a conceptual portrayal of potential development under the LRDP that would be consistent with the 2006 LRDP goals and objectives, the LBNL Design Guidelines, and the LRDP's proposed development uses and square footages. The Illustrative Development Scenario is intended to provide a conservative basis for the analysis of environmental impacts. Actual overall development that is approved and constructed pursuant to the LRDP would be less intense than portrayed in the scenario. The scenario was developed before the proposed 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. At any particular site, however, the level of development may approach the intensity that is portrayed in the scenario, so the scenario remains an appropriate and conservative basis for evaluating the potential environmental impacts of the proposed 2006 LRDP.

The EIR uses the Illustrative Development Scenario in the following ways:

- 1) To illustrate potential development pursuant to the 2006 LRDP based upon a conceptual portrayal of such potential development, and therefore give the reviewer an illustrative sense of the scope and scale of potential development at any particular site pursuant to the LRDP.
- 2) To provide a basis for the EIR's analysis of project impacts consistent with the CEQA Guidelines provisions for program EIRs and consideration and evaluation of future actions after the program EIR has been certified; and
- 3) To provide a basis for such quantified or modeled studies as the Human Health Risk Assessment and visual simulations.

The Illustrative Development Scenario shows approximate siting and dimensions of new buildings, parking garages, and roadway changes, and demolition of existing buildings. Consistent with the LRDP Land Use Plan, the Illustrative Development Scenario indicates that development of major new buildings would take place within the Research and Academic, Central Commons, and Support Services zones of the Lab. Parking structures and a number of parking lots would be spread relatively evenly throughout the Lab. Two redevelopment areas are identified, in the Old Town and Bevatron areas. The Illustrative Development Scenario also includes the already constructed Molecular Foundry building.

While actual development at LBNL under the term of the 2006 LRDP would likely not be precisely what is presented in this Illustrative Development Scenario, LBNL would consider how each individual project conforms to the assumptions and impact analyses presented in the 2006 LRDP EIR to determine what, if any, further CEQA documentation is necessary at that time. If

specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Sections 15168(d)(1-3). This use of the Illustrative Development Scenario in connection with further approvals is subject to the overall limitations on subsequent review that have been stated elsewhere in this EIR. In particular, this EIR (including the Illustrative Development Scenario) will not be used as a first-tier EIR for, or to reduce or streamline the subsequent CEQA processing of, any project that, when added to other construction pursuant to this LRDP, exceeds a net total of 980,000 gross square feet of new construction or 320,000 gross square feet of demolition.

It is important to understand the difference between the provisions of the proposed LRDP and the descriptions contained in the Illustrative Development Scenario. If adopted, the provisions of the LRDP will become binding planning guidelines and policies for the Laboratory, and later projects carried out by the Laboratory must be consistent with the LRDP (unless the LRDP is amended). In contrast, the descriptions contained in the Illustrative Development Scenario are not binding or governing policies, but the Illustrative Development Scenario will be part of the information that is considered in determining the appropriate form of CEQA review for later approvals of specific projects pursuant to the LRDP. Thus the scenario is illustrative, and is provided in this EIR for the purpose of evaluating the impacts of development that may occur pursuant to the proposed LRDP. Under the CEQA Guidelines, for later approvals based on a program EIR, the Illustrative Development Scenario may be considered (along with other information, and along with the overall limitations on subsequent review that have been stated elsewhere in this EIR) in determining whether the proposed later approval is within the scope of this EIR's analysis, or whether some level of further analysis is required under CEQA.

2.1.7 Required Project Approvals and Intended Uses of This EIR

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land owned or controlled by the University. The Board of Regents is the University's decision-making body and is responsible for approving the LRDP and the physical facilities to be constructed on University-owned land. The Regents will review and consider this EIR in conjunction with review and consideration of the LRDP. It is anticipated that these documents would be presented for The Regents' consideration and approval at one of the 2007 Regents meetings after the Lab has prepared a Final EIR including responses to all of the comments that have been submitted. In addition, the Berkeley Lab Design Guidelines, which are referenced in this EIR and included in Appendix B, are proposed to be adopted by the Lab as a companion document to the 2006 LRDP.

This EIR is intended to be used for the following actions, and will serve the following purposes:

- 1) The EIR provides The Regents with information upon which to evaluate the environmental implications of the LBNL 2006 LRDP, including environmental impacts and mitigation measures that could avoid some of those impacts, and the EIR will be used as the CEQA document for The Regents' consideration of the 2006 LRDP, and the adoption of required findings and other actions by The Regents in connection with their consideration and possible adoption of the LRDP.
- 2) The EIR will also serve as the CEQA document for the adoption by the Lab of the Berkeley Lab Design Guidelines.
- 3) The EIR will also be utilized in connection with the consideration by the Lab and/or by The Regents of specific projects pursuant to the LRDP, and possibly for the later modification of such projects. Pursuant to CEQA Guidelines Section 15168 and as described in Chapter I (Introduction), some projects may be approved as within the scope of this EIR and other projects will be approved after a second-tier CEQA document is prepared. Any use of this EIR in connection with subsequent approval is subject to two additional restrictions, also described in Chapter I, that resulted from consultations with the City of Berkeley. This EIR will not be used as the first-tier EIR for (or otherwise to streamline review of) any project exceeding a net total of 980,000 gross square feet of new construction or 320,000 gross square feet of demolition, and a new traffic study will be prepared on the earliest to occur of ten years after this EIR is certified or the date on which development at the Lab pursuant to the 2006 LRDP reaches 375 net new parking spaces.
- 4) Consistent with the use of this EIR for specific projects pursuant to CEQA Guidelines Section 15168, this EIR will also provide information to responsible agencies with permitting or approval authority over projects that may be implemented under the 2006 LRDP, including the potential approvals listed under “permitting and approvals” below; and
- 5) This EIR is also intended to be used by the Lab and by The Regents, consistent with the provisions of CEQA, in connection with other specific actions that may be necessary or desirable to approve and implement the 2006 LRDP.

2.2 Environmental Impacts

Impacts and mitigation measures of implementation of the proposed 2006 LRDP are summarized in Table II-1, at the conclusion of this chapter.

This EIR identifies significant unavoidable impacts in the following topic areas: aesthetics (changes in views and in visual character), air quality (cumulative exposure to toxic air contaminants), cultural resources (demolition or alteration of historical resources), noise (temporary construction-related noise impacts, and contribution to cumulative construction noise impacts), and traffic (unacceptable levels of service at local intersections and contribution to cumulative intersection impacts).

2.3 Alternatives

This Draft EIR analyzes four alternatives to the proposed 2006 LRDP: a no project alternative (as required by CEQA), two reduced project alternatives, a Preservation alternative, and an off-site

alternative. These alternatives are summarized below. Additionally, a reservation alternative and a no growth alternative were considered and rejected; the explanation is given in Chapter V.

2.3.1 No Project Alternative

2.3.1.1 Description

The No Project Alternative would result in development at the main LBNL site pursuant to the existing 1987 LRDP, and the proposed 2006 LRDP would not be implemented. Under the No Project Alternative, the amount of occupiable building space would increase up to approximately 2 million gsf, or roughly 13 percent above existing conditions, and the ADP would increase by about nine percent, to 4,750. No increases in the parking supply would occur. With the exception of a few projects that have been approved but are not yet constructed, future development at the hill site would require demolition of existing space. Such redevelopment on the hill site would be subject to project-specific environmental review, most likely tiered from the 1987 LRDP EIR, as amended. Additionally, any future development would be subject to the goals, objectives and mitigation measures identified within the 1987 LRDP and 1987 LRDP EIR, as amended.

Projects that have been approved pursuant to the 1987 LRDP, but not yet constructed, that would likely be developed and constructed under the No Project Alternative with continued implementation of the 1987 LRDP include the 25,000-square-foot Guest House, the approximately 30,000-square-foot User Support Building, and the 7,100-square-foot Animal Care Facility, identified within the Illustrative Development Scenario as Buildings S-5, S-6, and S-15, respectively. The Computational Research & Theory (CRT) Building (Building S-1 under the Illustrative Development Scenario), could also be constructed under the No Project Alternative, at a later date, following removal of Building 51 and the Bevatron. Under the No Project Alternative, roadway and parking improvements (but not an increase in parking spaces) and utility upgrades that are part of the project would be constructed. To accommodate future growth under the No Project Alternative, an increase in off-site leased space could occur.

The No Project Alternative would advance few, if any, of the objectives of the proposed project related to the continuing advancement of science and improvement of facilities at LBNL.

2.3.1.2 Impacts

As compared with the proposed project, the No Project Alternative would result in fewer impacts, and the intensity of the impacts described in Chapter IV of this EIR would be substantially less than with the proposed project. The No Project Alternative would not avoid the project's significant and unavoidable cultural resources impact of demolition of the Building 51 complex and the Bevatron, although this alternative could reduce the significant and unavoidable impact associated with the potential for implementation of the 2006 LRDP to cause a substantial adverse change in the significance of historical resources that have not yet been identified. Like the project, this alternative would contribute to a significant, unavoidable cumulative air quality impact related to emissions of toxic air contaminants. The No Project Alternative would avoid the

project's significant and unavoidable aesthetic, noise and traffic impacts. Impacts of this alternative are summarized in Table V-2, in Chapter V, Alternatives.

2.3.2 Reduced Growth 1 Alternative

2.3.2.1 Description

The Reduced Growth 1 Alternative would consist of development at the main hill site at a lower intensity than what is proposed under the 2006 LRDP. This alternative would provide for an ADP of up to about 5,135, up to 2,176,200 square feet of occupiable building space at the main hill site and approximately 2,675 parking spaces at the hill site. Because this alternative would reduce the significant and unavoidable impacts associated with the project more than would any other alternative other than the No Project Alternative, this alternative would be considered the environmentally superior alternative.

Compared to the proposed 2006 LRDP (including the reduction and the scope of the proposed LRDP in response to comments from the City of Berkeley), this alternative would represent about 63 percent of the net new occupiable building space, about 76 percent of the new ADP, and 75 percent of the net new parking spaces proposed under the 2006 LRDP. Under this alternative, future demand for any additional building space would be accommodated in leased space at off-site locations.

While this alternative would be more likely to meet key project objectives than would the No Project Alternative, it would not fully meet the Lab's objectives. Specifically, by allowing for less growth in space and population on the hill site, this alternative would be less conducive to the advancement of LBNL's scientific mission, and it could limit the Lab's ability to develop research facilities and infrastructure to meet anticipated future growth in research. Additionally, this alternative would not foster collaborative work environments among researchers, since it could result in a split of resources between locations as greater use of some off-site locations could be necessary to accommodate the Lab's future growth.

2.3.2.2 Impacts

The Reduced Growth 1 Alternative would generally result in lesser impacts than would the proposed 2006 LRDP, due to the lesser intensity of development, although this alternative would, like the project, result in a significant and unavoidable impact on cultural resources due to demolition of the Building 51 complex and the Bevatron, as well as on other potential resources. Also like the project, this alternative would result in significant, unavoidable impacts—albeit at a lesser intensity—on visual quality, would result in significant, unavoidable project-specific and cumulative impacts related to construction noise, and would contribute to a significant unavoidable cumulative air quality impact related to emissions of toxic air contaminants. The Reduced Growth 1 Alternative would avoid the project's significant traffic impact at the Hearst-Gayley/La Loma intersection, but would have project-specific and cumulative significant and unavoidable impacts at other local intersections, in a manner similar to the project. Impacts of this alternative are summarized in Table V-2, in Chapter V, Alternatives.

2.3.3 Reduced Growth 2 Alternative

2.3.3.1 Description

The Reduced Growth 2 Alternative proposes a development intensity at the main hill site that is lower (both in terms of ADP and occupiable building space) than the intensity of development that was initially proposed in the 2006 LRDP when the Notice of Preparation was issued. However, this alternative would have a development intensity at the main hill site than is greater than the ADP and occupiable building space proposed under Reduced Growth 1 Alternative, and would provide somewhat less net new occupiable building space than that currently proposed pursuant to the 2006 LRDP, but incrementally more ADP. The Reduced Growth 2 Alternative could result in an ADP up to about 5,400, up to 2,350,000 square feet of occupiable building space at the main hill site, and approximately 2,675 parking spaces at the hill site. Compared to the 2006 LRDP as currently proposed, including the reduction in scope pursuant to the comments from the City of Berkeley, this alternative represents 102.5 percent of the new ADP, about 89 percent of the net new occupiable building space, and 75 percent of the net new parking spaces. When compared to the LRDP as initially proposed when the Notice of Preparation was issued, this alternative represents roughly 90 percent of the new ADP, about three-quarters of the net new occupiable building space, and 62.5 percent of the net new parking spaces.

2.3.3.2 Impacts

The Reduced Growth 2 Alternative would have impacts that would be very similar to those of the currently proposed 2006 LRDP, although it would have somewhat lesser impacts than the LRDP as originally proposed and described in the Notice of Preparation. This alternative would have the same significant, unavoidable impacts as the proposed project on cultural resources (demolition of the Building 51 complex and the Bevatron and other potential resources), visual quality (changes in views and visual character), and noise (project-specific and cumulative construction noise impacts). Like the project, this alternative would result in a significant, unavoidable cumulative impact related to emissions of toxic air contaminants. The Reduced Growth 2 Alternative would avoid the project's significant traffic impact at the Hearst-Gayley/La Loma intersection, but would have project-specific and cumulative significant and unavoidable impacts at other local intersections, in a manner similar to the project. Impacts of this alternative are summarized in Table V-2, in Chapter V, Alternatives.

2.3.4 Preservation Alternative with Non-LBNL Use of Historical Resources

2.3.4.1 Description

Under the Non-LBNL Use Preservation Alternative, a limited number of key historical resources, when determined to be no longer of feasible use to Berkeley Lab, would be dedicated to non-LBNL uses and could be managed by another public agency, such as the National Park Service. This alternative was originally drafted for the EIR on the proposed demolition of Building 51 and the Bevatron, with the intention of actively preserving Building 51 and the Bevatron equipment

within it. It is assumed that this alternative could possibly be extended to a limited number of other key historical resources, should such resources be identified and be proposed for demolition by the Lab. (To date, no other such resources have been proposed for demolition.) Under this alternative, another agency would maintain and preserve the historical resource(s) in accordance with the *Secretary of the Interior's Standards for Preservation*, and would allow limited public access for interpretive/educational purposes.

While this alternative could reduce or eliminate significant impacts to historical resources, it could substantially complicate implementation of the proposed LRDP, particularly if multiple historical resources were to be involved over time. Moreover, the Lab's existence as a secure facility would largely limit public access to such resources.

2.3.4.2 Impacts

The Non-LBNL Use Preservation Alternative would avoid the proposed 2006 LRDP's significant, unavoidable effects on cultural resources but would result in the same impacts as the proposed project in other respects, as the development program would otherwise be the same. Therefore, this alternative would have the same significant, unavoidable impacts as the proposed project on visual quality (changes in views and visual character), noise (project-specific and cumulative construction noise impacts), air quality (significant unavoidable cumulative impact related to emissions of toxic air contaminants), and transportation (project-specific and cumulative significant and unavoidable impacts at local intersections).

Impacts of this alternative are summarized in Table V-2, in Chapter V, Alternatives.

2.3.5 Off-Site Alternative

2.3.5.1 Description

The Off-Site Alternative proposes that all development under the 2006 LRDP, including increases in ADP, occupiable building space and parking spaces, would be accommodated at the hill site and at an off-site location in the Bay Area, specifically the Richmond Field Station (RFS). The RFS, owned by The UC Regents, occupies approximately 162 acres on the shore of San Francisco Bay, about six miles to the northwest of the LBNL main site. The RFS site consists of approximately 90 acres of upland, industrially zoned land that is used primarily for research and development, and 72 acres of marsh and tidal mudflat. The site is in a historically industrialized zone. At the RFS, an ADP of 390 would be accommodated, and 383,800 square feet of new occupiable building space and 225 new parking spaces would be constructed.

The development program at the hill site would accommodate the remaining projected growth under the 2006 LRDP, and would be the same as the Reduced Growth 1 Alternative. Under the Off-Site Alternative, development at the hill site, compared to the 2006 LRDP, would represent 63 percent of the occupiable building space, about three-quarters of the ADP, and 75 percent of the parking spaces proposed under the 2006 LRDP.

Taking into account LBNL growth at the hill site and the RFS under this alternative, the overall development potential at the 2025 planning horizon for the Lab would be the same as initially proposed in the 2006 LRDP when the Notice of Preparation was issued. While this alternative would meet key project objectives regarding levels of ADP, occupiable building space, and parking, this alternative would not meet the project objectives to expand functionality of Lab facilities, provide for cross-disciplinary research, or foster collaborative work environments among researchers, since it would result in a division of resources between locations.

2.3.5.2 Impacts

The Off-Site Alternative would generally result in lesser impacts on the LBNL main hill site than would the proposed 2006 LRDP, although it would not avoid the project's significant and unavoidable impacts on cultural resources (demolition of the Building 51 complex and the Bevatron and other potential resources), visual quality (changes in views and visual character), noise (project-specific and cumulative construction noise impacts), and air quality (significant unavoidable cumulative impact related to emissions of toxic air contaminants). This alternative would avoid the project's significant traffic impact at the Hearst-Gayley/La Loma intersection, but would have project-specific and cumulative significant and unavoidable impacts at other local intersections, in a manner similar to the project. Impacts of this alternative are summarized in Table V-2, in Chapter V, Alternatives.

2.4 Impact Summary Table

Table II-1 presents a summary of impacts and mitigation measures identified in this report. It is organized to correspond with environmental issues discussed in Chapter IV. The table is arranged in three columns: 1) environmental impacts (with level of significance prior to mitigation, if applicable, noted in parentheses); 2) mitigation measures; and 3) level significance after mitigation. For a complete description of potential impacts and mitigation measures, please refer to the technical section within Chapter IV.

**TABLE II-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Aesthetics and Visual Quality		
VIS-1: Construction of the proposed LRDP buildings would create temporary aesthetic nuisances for adjacent land uses. (Less than Significant)	None required.	Less than Significant
VIS-2: The proposed project could alter views of the LBNL site, and could result in a substantial adverse effect to a scenic vista or substantially damage scenic resources. (Significant and Unavoidable)	No mitigation is identified beyond the implementation of the LBNL Design Guidelines and the accompanying policy direction in the draft LRDP, and this impact is considered significant and unavoidable. However, Chapter V of this EIR includes the Reduced Growth 1 Alternative, which would result in lesser changes in the visual environment by constructing less overall building square footage and buildings of reduced height and mass. This alternative would result in lesser aesthetic impacts than would the proposed project.	Significant and Unavoidable
VIS-3: The proposed project would alter the existing visual character of the Lab site and could substantially degrade the existing visual character and quality of the site and its surroundings. (Significant and Unavoidable)	No mitigation is identified beyond the implementation of the LBNL Design Guidelines and the accompanying policy direction in the draft LRDP, and this impact is considered significant and unavoidable. However, Chapter V of this EIR includes the Reduced Growth 1 Alternative, which would result in lesser changes in the visual environment by constructing less overall building square footage and buildings of reduced height and mass. This alternative would result in lesser aesthetic impacts than would the proposed project.	Significant and Unavoidable
VIS-4: Implementation of the LRDP would introduce new sources of light and glare into the LBNL site and increase the overall level of ambient light in the site vicinity. (Significant; Less than Significant with Mitigation)	<p>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.</p> <p>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).</p> <p>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.</p>	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Aesthetics and Visual Quality (cont.)		
<p>VIS-5: Implementation of the LRDP, in conjunction with cumulative development, would alter the visual character of, and change views of, the Oakland-Berkeley hills in the vicinity of Berkeley Lab. (Less than Significant)</p>	None required.	Less than Significant
Air Quality		
<p>AQ-1: Construction of new facilities proposed under the LBNL 2006 LRDP would generate short-term emissions of fugitive dust and criteria air pollutants that would affect local air quality in the vicinity of construction sites. (Significant; Less than Significant with Mitigation)</p>	<p>AQ-1a: The BAAQMD’s approach to dust abatement calls for “basic” control measures that should be implemented at all construction sites, “enhanced” control measures that should be implemented at construction sites greater than four acres in area, and “optional” control measures that should be implemented on a case-by-case basis at construction sites that are large in area or are located near sensitive receptors, or that, for any other reason, may warrant additional emissions reductions (BAAQMD, 1999).</p> <p>During construction of individual projects proposed under the LRDP, LBNL shall require construction contractors to implement the appropriate level of mitigation (as detailed below), based on the size of the construction area, to maintain project construction-related impacts at acceptable levels; this would reduce the potential impact to a less-than-significant level.</p> <p>Elements of the “basic” dust control program for project components that disturb less than one acre shall include the following at a minimum:</p> <ul style="list-style-type: none"> • Water all active construction areas at least twice daily. Watering should be sufficient to prevent airborne dust from leaving the site. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water should be used whenever possible. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer). • Pave, apply water three times daily (or as sufficient to prevent dust from leaving the site), or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites. 	Less than Significant

TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Air Quality (cont.) AQ-1 (cont.)	<ul style="list-style-type: none"> • Sweep daily or as appropriate (with water sweepers using reclaimed water if possible) all paved access roads, parking areas and staging areas at construction sites. • Sweep streets daily or as appropriate (with water sweepers using reclaimed water if possible) if visible soil material is carried onto adjacent public streets. <p>Elements of the “enhanced” dust abatement program for project components that disturb four or more acres shall include all of the “basic” measures in addition to the following measures:</p> <ul style="list-style-type: none"> • Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more). • Enclose, cover, water twice daily (or as sufficient to prevent dust from leaving the site), or apply (non-toxic) soil stabilizers to exposed stockpiles (dirt, sand, etc.). • Limit traffic speeds on unpaved roads to 15 miles per hour. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways. • Replant vegetation in disturbed areas as quickly as possible. <p>Elements of the “optional” control measures are strongly encouraged at construction sites that are large in area or located near sensitive receptors, or that for any other reason may warrant additional emissions reductions:</p> <ul style="list-style-type: none"> • Install wheel washers for all exiting trucks, or wash off tires or tracks of all trucks and equipment leaving the site. • Install wind breaks, or plant trees/vegetative wind breaks at windward side(s) of construction areas. • Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 miles per hour. • Limit the area subject to excavation, grading, and other construction activity at any one time. 	

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Air Quality (cont.)		
AQ-1 (cont.)	<ul style="list-style-type: none"> • Pave all roadways, driveways, sidewalks, etc. as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used. • Designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust off-site. Their duties shall include holidays and weekend periods when work may not be in progress. The names and telephone numbers of such persons shall be provided to the BAAQMD prior to the start of construction. <p>AQ-1b: To mitigate equipment exhaust emissions, LBNL shall require its construction contractors to comply with the following measures:</p> <ul style="list-style-type: none"> • Construction equipment shall be properly tuned and maintained in accordance with manufacturers' specifications. • Best management construction practices shall be used to avoid unnecessary emissions (e.g., trucks 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 the California Air Resources Board. • Incorporate use of low-NOx 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. 	Less than Significant
AQ-2: Proposed development under the LBNL 2006 LRDP would generate long-term emissions of criteria air pollutants from increases in traffic and stationary sources. (Less than Significant)	None required.	Less than Significant
AQ-3: Proposed development under the LBNL 2006 LRDP would increase carbon monoxide concentrations at busy intersections and congested roadways in the project vicinity. (Less than Significant)	None required.	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Air Quality (cont.)		
AQ-4: Implementation of the proposed 2006 LRDP would expose people to toxic air contaminants. (Significant; Less than Significant with Mitigation)	AQ-4a: To avoid the single location where implementation of the 2006 LRDP would result in an increase in health risk in excess of the 10-in-one-million threshold, LBNL shall adjust, prior to the construction of parking structure PS-1 (or similarly configured building), the exhaust system of the existing generator near Building 90 to reduce or eliminate the restriction on upward exhaust flow caused by the existing rain cap. For example, modeling indicates that removal of the rain cap would reduce the risk caused by construction of parking structure PS-1 in proximity to the existing generator to a level below 10 in one million. The Lab could install a hinged rain cap, which would prevent moisture infiltration into the generator but still allow unobstructed exhaust flow and would avoid the significant impact identified in the health risk assessment.	Less than Significant
AQ-5: The project, together with anticipated future cumulative development in Berkeley and the Bay Area in general, would contribute to regional increases in criteria air pollutants. (Less than Significant)	None required.	Less than Significant
AQ-6: Even though cumulative emissions of toxic air contaminants would decrease, implementation of the LBNL 2006 LRDP, in combination with other potential contributing projects, would contribute to cumulative emissions of toxic air contaminants that result in an excess cancer risk that exceeds, and would continue to exceed, 10 in one million. (Significant and Unavoidable)	Because most of the cancer risk from TACs is due to diesel particulate, measures to reduce the risk (beyond regulations already in place that will substantially reduce diesel particulate emissions in the next 20 years) would include those measures that could reduce vehicular travel to and from Berkeley Lab. Implementation of Mitigation Measure TRANS-1c, development and implementation of a new Transportation Demand Management Program (see Section IV.L, Transportation/Traffic), would result in a concomitant increase in vehicular emissions, including those of TACs. However, even with implementation of this measure, Berkeley Lab, as a major employer and thus a substantial source of vehicular traffic, would likely continue to contribute to Bay Area-wide emissions of TACs for the foreseeable future.	Significant and Unavoidable
Biological Resources		
BIO-1: Development proposed under the 2006 LRDP would result in the permanent and/or temporary removal of some existing native and non-native vegetation. (Less than Significant)	None required.	Less than Significant
BIO-2: Development under the 2006 LRDP could result in adverse impacts to drainages and/or wetlands subject to Corps and CDFG jurisdiction, including permanent or temporary fill, and accidental discharges of fill materials or other deleterious substances during construction. (Significant; Less than Significant with Mitigation)	BIO-2a: Future development under the 2006 LRDP shall avoid, to the extent feasible, the fill of potentially jurisdictional waters. Therefore, during the design phase of any future development project that may affect potentially jurisdictional waters, a preliminary evaluation of the project site shall be made by a qualified biologist to determine if the site	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
<p>Biological Resources (cont.)</p> <p>BIO-2 (cont.)</p>	<p>is proximate to potentially jurisdictional waters and, if deemed necessary by the biologist, a wetlands delineation shall be prepared and submitted to the Corps for verification.</p> <p>Most development projected under the 2006 LRDP would have no potential for impacts on jurisdictional waters. However, development in specific locations including Buildings S-2 and S-0, as well as Parking Structures and Lots PS-1 and PL-9 and Roads R-2 and R-5, could require fill of or create the potential for accidental discharges to jurisdictional waters. It should be noted that the preferable form of mitigation recommended by the Corps is avoidance of jurisdictional waters. To the extent practicable, new development under the 2006 LRDP shall be located so as to avoid the fill of jurisdictional waters.</p> <p>BIO-2b: Any unavoidable loss of jurisdictional waters shall be compensated for through the development and implementation of a project-specific Wetlands Mitigation Plan.</p> <p>In the event that potential impacts to streams resulting from a 2006 LRDP development project are identified, compensation for loss of jurisdictional waters would be based on the Corps-verified wetlands delineation identified in Mitigation Measure BIO-2.a. During the permit application process for specific development project(s) with identified impacts on jurisdictional drainages or wetlands, LBNL would consult with the Corps, CDFG, and Regional Water Quality Control Board regarding the most appropriate assessment and mitigation methods to adequately address losses to wetland function that could occur as a result of the development project(s). A project-specific wetland mitigation plan would be developed prior to project implementation and submitted to permitting agencies for their approval. The plan may include one or more of the following mitigation options: restoration, rehabilitation, or enhancement of drainages and wetlands in on-site areas that remain unaffected by grading and project development or off-site at one or more suitable locations within the project region; creation of on-site or off-site drainages or wetlands at a minimum of a 1:1 functional equivalency or acreage ratio (as verified by the Corps); purchase of credits in an authorized mitigation bank acceptable to the Corps and CDFG; contributions in support of restoration and enhancement programs located within the project region (such as those operated by local non-profit organizations including the Friends of Strawberry Creek, the Urban Creeks Council, or the Waterways Restoration Institute); or other options approved by the appropriate regulatory agency at the time of the specific project approval.</p>	

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)	<p>All mitigation work proposed in existing wetlands or drainages on- or off-site shall be authorized by applicable permits.</p> <p>BIO-2c: To the extent feasible, construction projects that might affect jurisdictional drainages and/or wetlands could be scheduled for dry-weather months.</p> <p>Avoiding ground-disturbing activities during the rainy season would further decrease the potential risk of construction-related discharges to jurisdictional waters.</p>	
<p>BIO-3: Construction activities proposed under the 2006 LRDP could adversely affect special-status nesting birds (including raptors) such that they abandon their nests or such that their reproductive efforts fail. (Significant; Less than Significant with Mitigation)</p>	<p>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 IV.C-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 nesting special-status nesting birds:</p> <ol style="list-style-type: none"> 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: 	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)		
BIO-3 (cont.)	<ul style="list-style-type: none"> 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. <p>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.</p> <p>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.</p> <p>6. Destruction of active nests of special-status birds and overt interference with nesting activities of special-status birds shall be prohibited.</p> <p>7. The noise control procedures for maximum noise, equipment, and operations identified in Section IV.I, Noise, of this EIR shall be implemented.</p>	
<p>BIO-4: Removal of trees and other proposed construction activities during the breeding season could result in direct mortality of special-status bats. In addition, construction noise and human disturbance could cause maternity roost abandonment and subsequent death of young. (Significant; Less than Significant with Mitigation)</p>	<p>BIO-4: Project implementation under the 2006 LRDP shall avoid disturbance to the maternity roosts of special-status bats during the breeding season in accordance with the following procedures for Pre-Construction Special-Status Bat Surveys and Subsequent Actions. No more than two weeks in advance of any demolition or construction activity involving concrete breaking or similarly noisy or intrusive activities, that would commence during the breeding season (March 1 through August 31), a qualified bat biologist, acceptable to the CDFG, shall conduct pre-demolition surveys of all potential special-status bat</p>	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)	<p data-bbox="911 443 1583 516">breeding habitat in the vicinity of the planned activity. Depending on the survey findings, the following actions shall be taken to avoid potential adverse effects on breeding special-status bats:</p> <ol data-bbox="911 532 1583 1372" style="list-style-type: none"> <li data-bbox="911 532 1583 654">1. If active roosts are identified during pre-construction surveys, a no-disturbance buffer will be created by the qualified bat biologist, in consultation with the CDFG, around active roosts during the breeding season. The size of the buffer will take into account factors such as the following: <ol data-bbox="947 670 1583 873" style="list-style-type: none"> <li data-bbox="947 670 1583 743">a. Noise and human disturbance levels at the project site and the roost site at the time of the survey and the noise and disturbance expected during the construction activity; <li data-bbox="947 760 1583 808">b. Distance and amount of vegetation or other screening between the project site and the roost; and <li data-bbox="947 824 1583 873">c. Sensitivity of individual nesting species and the behaviors of the bats. <li data-bbox="911 889 1583 963">2. If pre-construction surveys indicate that no roosts of special-status bats are present, or that roosts are inactive or potential habitat is unoccupied, no further mitigation is required. <li data-bbox="911 979 1583 1052">3. Pre-construction surveys are not required for demolition or construction activities scheduled to occur during the non-breeding season (September 1 through February 28). <li data-bbox="911 1068 1583 1287">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 bats taking up roosts would be acclimated to project-related activities already under way). However, if trees are to be removed during the breeding season, the trees would be surveyed for roosts prior to their removal, according to the survey and protective action guidelines 1a through 1c, above. <li data-bbox="911 1304 1583 1372">5. Bat roosts initiated during demolition or construction activities are presumed to be unaffected by the activity, and a buffer is not necessary. 	

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)		
BIO-4: (cont.)	<p>6. Destruction of roosts of special-status bats and overt interference with roosting activities of special-status bats shall be prohibited.</p> <p>7. The noise control procedures for maximum noise, equipment, and operations identified in Section IV.I, Noise, of this EIR shall be implemented.</p>	
BIO-5: Implementation of the 2006 LRDP could result in take or harassment of Alameda whipsnakes. (Significant; Less than Significant with Mitigation)	<p>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.</p> <p>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.</p> <p>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.</p>	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>BIO-5e: Hours of operation and speed limits shall be instituted and posted.</p>	

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
<p>Biological Resources (cont.)</p> <p>BIO-5 (cont.)</p>	<p>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.</p> <p>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.</p> <p>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.</p>	
<p>BIO-6: Project activities allowed under the LRDP, including facilities and road construction in areas designated for use as Research and Academic, Central Commons, and Support Services zones, as well as vegetation management activities in designated Perimeter Open Space, could result in the take of special-status plant species. Construction activities, as well as vegetation management activities, have the potential to disturb or result in mortality of these species or eliminate their habitat. (Significant; Less than Significant with Mitigation)</p>	<p>BIO-6a: Floristic surveys for special-status plants shall be conducted at specific project sites where suitable habitat is present. Floristic surveys shall also be conducted in designated Perimeter Open Space. All occurrences of special-status plant populations, if any, shall be mapped.</p> <p>Although no special-status plants have been observed at LBNL during past biological resource surveys, the distribution and size of plant populations often vary from year to year, depending on climatic conditions. Therefore, a baseline survey of all non-developed areas, including the designated Perimeter Open Space areas, where there is potential for future development or vegetation management activities, should be conducted in accordance with USFWS and CDFG guidelines by a qualified botanist during the period of identification for all special-status plants. During this initial survey, any special-status plant populations found, as well as areas with high potential for supporting special-status plants (i.e., less disturbed areas, rock outcrops and other areas of thin soils, areas supporting a relatively high proportion of native plant species) would be identified and mapped. Thereafter, surveys of Perimeter Open Space areas where ongoing vegetation management (i.e., active vegetation removal to minimize potential wildland fire</p>	<p>Less than Significant</p>

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
<p>Biological Resources (cont.)</p> <p>BIO-6 (cont.)</p>	<p>damage to facilities and personnel) activities would be undertaken, and that are mapped as supporting or having potential to support special-status plant species, would be conducted in April and June every five years.</p> <p>In those proposed LRDP development sites where suitable habitat is present for special-status species identified as having a moderate to high potential for occurrence (see Table IV.C-1, p. IV.C-10), protocol-level rare plant surveys would be conducted prior to construction. Surveys should be conducted during the periods of identification for all species under consideration at each applicable development site, the timing and scope to be directed by a qualified botanist. During the initial survey, any special-status plant populations found, as well as all areas with high potential for supporting special-status plants (i.e. less disturbed areas, rock outcrops and other areas of thin soils, areas supporting a relatively high proportion of native plant species), would be identified and mapped.</p> <p>BIO-6b: Seeds or cuttings shall be collected from sensitive plant species found within developable areas and open space and at risk of being any adversely affected, or sensitive plants found in these areas shall be transplanted.</p> <p>If special-status plants are found during floristic surveys and are at risk of being adversely affected, a qualified botanist working in conjunction with an expert in native plant horticulture, CNPS, and CDFG, would collect seeds, bulbs, and cuttings for propagation and planting in specific project revegetation efforts as well as restoration of native habitat within designated Open Space. Perennial species could be transplanted, if found in undeveloped locations that have a high likelihood for future development. Due to its unreliability, translocation alone should not be relied upon as a sole means of mitigation; however, healthy individuals of any special-status plant species should be transplanted to areas of suitable habitat that are protected in perpetuity. The relocation sites may be located either on or off the LBNL hill site. If the areas for transplanting are located off-site, they should be within a 20-mile radius of the project site. Plants should be relocated to areas with ecological conditions (slope, aspect, microclimate, soil moisture, etc.) as similar to those in which they were found as possible. Existing plants could also be held in containers for specific post-project revegetation efforts on-site.</p>	

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Biological Resources (cont.)		
BIO-7: Development pursuant to the 2006 LRDP, when combined with development under the UC Berkeley LRDP as well as surrounding (primarily residential) development in the Oakland-Berkeley hills, would contribute to a reduction of open space and, consequently, habitat for native plants and wildlife, including special-status species. (Less than Significant)	None required.	Less than Significant
Cultural Resources		
CUL-1: Implementation of the 2006 LRDP could cause a substantial adverse change in the significance of historical resources, as defined in CEQA Guidelines Section 15064.5, including historical resources that have not yet been identified. (Significant and Unavoidable)	CUL-1: Mitigation for the demolition or substantial physical alteration of Buildings 71 and 88, and other historical buildings and structures at LBNL found to be significant historical resources at the completion of the ongoing surveys and research, shall include the development of a Memorandum of Agreement (MOA) among the Department of Energy, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation. Full implementation of the MOA's stipulations shall also be required as part of this mitigation measure.	Significant and Unavoidable
CUL-2: The proposed 2006 LRDP would allow demolition of buildings and structures at LBNL that have been found to be ineligible for listing in the National Register individually or as a district. (Less than Significant)	None required.	Less than Significant
CUL-3: Implementation of the proposed 2006 LRDP could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5. (Significant; Less than Significant with Mitigation)	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.	Less than Significant
CUL-4: Implementation of the proposed 2006 LRDP could disturb human remains, including those interred outside of formal cemeteries. (Significant; Less than Significant with Mitigation)	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: <ul style="list-style-type: none"> • 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: 	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Cultural Resources		
CUL-4 (cont.)	<ul style="list-style-type: none"> (1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until: <ul style="list-style-type: none"> (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: <ul style="list-style-type: none"> (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. <ul style="list-style-type: none"> (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. 	
CUL-5: Implementation of the proposed 2006 LRDP would not combine with other cumulative projects to result in an adverse change to the significance of historical resources that share historic significance with resources that could be lost at Berkeley Lab. (Less than Significant)	None required.s	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Geology and Soils		
GEO-1: Future construction projects within the Alquist-Priolo Zone could expose people or structures to surface fault rupture. (Significant; Less than Significant with Mitigation)	GEO-1: Seismic emergency response and evacuation plans for LBNL shall incorporate potential inaccessibility of the Blackberry Canyon entrance and identify alternative ingress and egress routes for emergency vehicles and facility employees in the event of roadway failure from surface fault rupture.	Less than Significant
GEO-2: Implementation of the LRDP would expose people and structures to seismic hazards such as groundshaking and earthquake-induced landsliding. (Significant; Less than Significant with Mitigation)	<p>GEO-2: A site-specific, design-level geotechnical investigation shall occur during the design phase of each LBNL building project, and prior to approval of new building construction within the LBNL hill site. This investigation shall be conducted by a licensed geotechnical engineer and include a seismic evaluation of potential maximum ground motion at the site. Geotechnical investigations for sites within either a Seismic Hazard Zone for landslides or an area of historic landslide activity at LBNL, as depicted on Figures IV.E-2 and IV.E-3, or newly recognized areas of slope instability at the inception of project planning, shall incorporate a landslide analysis in accordance with CGS Publication 117. Geotechnical recommendations shall subsequently be incorporated into building design.</p> <p>Earthquakes and groundshaking in the Bay Area are unavoidable and may occur at some time during the period covered by the LRDP. Although some structural damage is typically not avoidable, building codes and local construction requirements have been established to protect against building collapse and to minimize injury during a seismic event. Considering that the future individual buildings would be constructed in conformance with the California Building Code, LBNL requirements, federal regulations and guidelines, and Mitigation Measure GEO-2, the risks of injury and structural damage from groundshaking and earthquake-induced landsliding would be reduced and the impacts, therefore, would be considered less than significant.</p> <p>Furthermore, as described in the Project Description, some of the buildings constructed pursuant to the LRDP would be occupied by staff relocated from other, older LBNL facilities, some of which were constructed in accordance with less stringent building code requirements than those that would apply to future construction. As of 2003, 14 percent of LBNL buildings were over 60 years old. Many of these buildings were constructed as temporary structures that were never replaced. The LRDP specifically proposes the demolition of some 30 outdated buildings that together include approximately 250,000 square feet. In this regard, implementation of the LRDP would result in a beneficial seismic safety impact.</p>	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Geology and Soils		
GEO-3: Implementation of the LRDP would result in construction on soils that could be subject to erosion and instability. (Significant; Less than Significant with Mitigation)	<p>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 and hydroseeding or other suitable measures.</p> <p>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.</p> <p>Compliance with California Building Code standards and compliance with Mitigation Measures GEO-2, GEO-3a, and GEO-3b would reduce potential impacts associated with expansive soils and soil erosion to a less-than-significant level.</p>	Less than Significant
GEO-4: The proposed 2006 LRDP, when combined with cumulative growth, would increase the population exposed to geologic and seismic hazards. (Less than Significant)	None required for cumulative impacts, although Mitigation Measures GEO-1, GEO-2, GEO-3a, and GEO-3b would be implemented, as identified above.	Less than Significant
Hazards and Hazardous Materials		
HAZ-1: Demolition or renovation of existing structures could expose construction workers, the public, or the environment to hazardous materials in building materials. (Less than Significant)	None required.	Less than Significant
HAZ-2: Future construction activities, including earth-moving activities such as excavation and grading, could expose construction workers or the environment to hazardous materials. (Less than Significant)	None required.	Less than Significant
HAZ-3: Operation of LBNL pursuant to the 2006 LRDP, including proposed increases in laboratory and facility space, would increase the use of hazardous materials in research, facility construction, and facility maintenance activities, consequently resulting in increased generation, storage, transportation, and disposal of hazardous wastes, including transport associated with off-site disposal of hazardous and radioactive wastes, from research and facility maintenance activities. (Significant; Less than Significant with Mitigation)	<p>HAZ-3a: LBNL shall continue to prepare an annual self-assessment summary report and a Site Environmental Report that summarize environment, health, and safety program performance and identify any areas where LBNL is not in compliance with environmental laws and regulations governing hazardous materials, and worker safety, emergency response, and environmental protection.</p> <p>An EH&S assessment of LBNL activities is performed annually, and these results are reported annually in the LBNL Self-Assessment Report.</p>	Less than Significant
Hazards and Hazardous Materials		
HAZ-3 (cont.)	In addition, LBNL prepares an annual Site Environmental Report that	

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
	<p>describes the environmental activities noted above. Implementation of this measure would ensure that the information in the LBNL Self-Assessment and Site Environmental Reports continues to be collected, reviewed, and provided.</p> <p>HAZ-3b: Prior to shipping hazardous materials to a hazardous waste treatment, storage, or disposal facility, LBNL shall confirm that the facility is licensed to receive the type of waste LBNL is proposing to ship.</p> <p>LBNL is required by DOE Order 435.1 to verify that the receiving facility has all appropriate licenses and that the waste meets all waste acceptance criteria of the receiving facility.</p> <p>HAZ-3c: LBNL shall require hazardous waste haulers to provide evidence that they are appropriately licensed to transport the type of wastes being shipped from LBNL.</p> <p>Shipping procedures at LBNL require all transporters of hazardous, radioactive, and mixed waste to provide evidence that they are appropriately licensed.</p> <p>HAZ-3d: LBNL shall continue its waste minimization programs and strive to identify new and innovative methods to minimize hazardous waste generated by LBNL activities.</p> <p>Each LBNL Division is required to identify and implement new waste minimization activities each year. The waste minimization program at LBNL reduced hazardous waste by 72% during the period 1993-2004</p> <p>HAZ-3e: In addition to implementing the numerous employee communication and training requirements included in regulatory programs, LBNL shall undertake the following additional measures as ongoing reminders to workers of health and safety requirements:</p> <ul style="list-style-type: none"> • Continue to post phone numbers of LBNL EH&S subject matter experts on the EH&S website. • Continue to post Emergency Response and Evacuation Plans in all LBNL buildings. • Continue to post sinks, in areas where hazardous materials are handled, with signs reminding users that hazardous materials and wastes cannot be poured down the drain. 	

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Hazards and Hazardous Materials		
HAZ-3 (cont.)	<ul style="list-style-type: none"> • Continue to post dumpsters and central trash collection areas where hazardous materials are handled with signs reminding users that hazardous wastes cannot be disposed of as trash. <p>HAZ-3f: LBNL shall update its emergency preparedness and response program on an annual basis and shall provide copies of this program to local emergency response agencies and to members of the public upon request.</p>	
HAZ-4: Implementation of the LRDP would involve the handling of hazardous materials and wastes within one-quarter mile of an existing school. (Significant; Less than Significant with Mitigation)	See Mitigation Measures HAZ-3a through HAZ-3f, above.	Less than Significant
HAZ-5: Implementation of the LRDP could increase exposure of people or structures to hazards that could result from regional, compounded, or terrorist-related catastrophic events. (Less than Significant)	None required.	Less than Significant
HAZ-6: Implementation of the LRDP would expose people or structures to wildland fire hazards. (Less than Significant)	None required.	Less than Significant
HAZ-7: Implementation of the LRDP would contribute to cumulative increases in exposure to hazards and hazardous materials. (Less than Significant)	None required.	Less than Significant
Hydrology and Water Quality		
HYDRO-1: Construction pursuant to the LRDP, including earthmoving activities such as excavation and grading, could result in soil erosion and subsequent sedimentation of stormwater runoff or an increase in stormwater pollutants associated with construction-related hazardous materials. (Less than Significant)	None required.	Less than Significant
HYDRO-2: Implementation of the 2006 LRDP would adversely affect stormwater quality. (Less than Significant)	None required.	Less than Significant
HYDRO-3: Implementation of the LRDP would increase stormwater runoff rates and volumes, potentially resulting in erosion of creek channels or downstream flooding. (Less than Significant)	None required.	Less than Significant
HYDRO-4: Implementation of the LRDP, when combined with implementation of the UC Berkeley 2020 LRDP and other cumulative development, would not result in significantly adverse hydrologic or water quality impacts. (Less than Significant)	None required.	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Land Use and Planning		
LU-1: Implementation of the proposed 2006 LRDP would increase building square footage and adjusted daily population (ADP) at LBNL. Because new construction would be within developed areas and would not introduce substantially new land uses, the 2006 LRDP would not physically divide an established community. (Less than Significant)	None required.	Less than Significant
LU-2: Implementation of the proposed 2006 LRDP would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect, nor would the project conflict with local land use regulations such that a significant incompatibility is created with adjacent land uses. (Less than Significant)	None required.	Less than Significant
LU-3: The proposed 2006 LRDP, when combined with cumulative growth in the project vicinity, would increase the intensity of existing land uses in the area but would not physically divide an established community, conflict with applicable land use regulations, or cause conflicts with existing uses. (Less than Significant)	None required.	Less than Significant
Noise		
NOISE-1: Development under the proposed LRDP would result in temporary noise impacts related to construction and demolition activities. (Significant and Unavoidable)	<p>NOISE-1a: To reduce daytime noise impacts due to construction/demolition, LBNL shall require construction/demolition contractors 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:</p> <ul style="list-style-type: none"> • 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). 	Significant and Unavoidable

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
<p>Noise</p> <p>NOISE-1 (cont.)</p>	<ul style="list-style-type: none"> • 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. <p>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:</p> <ul style="list-style-type: none"> • 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 dBA. External jackets on the tools themselves shall be used where feasible, and this could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever feasible. 	

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Noise		
NOISE-1 (cont.)	<ul style="list-style-type: none"> • 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. 	
NOISE-2: Development under the proposed LRDP would result in temporary vibration impacts related to construction activities. (Less than Significant)	None required.	
NOISE-3: Project-generated vehicle traffic associated with the proposed LRDP would result in an incremental, and likely imperceptible, long-term increase in ambient noise levels. (Less than Significant)	None required.	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Noise		
NOISE-4: Continued operation of the LBNL hill site facility would result in a long-term increase in ambient noise levels. (Significant, Less than Significant with Mitigation)	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.	Less than Significant
NOISE-5: Development under the proposed LRDP would result in temporary contributions to cumulative noise impacts related to construction and demolition activities. (Significant and Unavoidable)	Implementation of Mitigation Measures NOISE-1a and NOISE-1b would reduce the cumulative impact of construction noise to the maximum extent feasible. However, for purposes of a conservative analysis, the cumulative effect of construction noise is considered significant and unavoidable.	Significant and Unavoidable
NOISE-6: Development pursuant to the 2006 LRDP, together with anticipated future development at LBNL and in the surrounding area, including the UC Berkeley 2020 LRDP, would result in a cumulative increase in noise levels. (Less than Significant)	None required.	Less than Significant
Population and Housing		
POP-1: The proposed LRDP would produce an increase in the number of people working at LBNL but would not induce substantial population growth in the City of Berkeley or elsewhere in the region, either directly or indirectly. (Less than Significant)	None required.	Less than Significant
POP-2: The proposed LRDP, in conjunction with the proposed UC Berkeley 2020 LRDP and other projects that could be developed in Berkeley, would induce population growth in the City of Berkeley and the Bay Area, but the contribution of the 2006 LRDP to this impact would not be cumulatively considerable. (Less than Significant)	None required.	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Public Services and Recreation		
PUB-1: The proposed project would result in an increase in demand for fire protection services. However, this increased demand would not result in the need for additional facilities for fire protection services. (Less than Significant)	None required.	Less than Significant
PUB-2: The proposed project would result in an increase in calls for police services. However, this increased demand would not result in the need for additional facilities for police protection services. (Less than Significant)	None required.	Less than Significant
PUB-3: Implementation of the 2006 LRDP would not result in the need for new or physically altered public school facilities. (Less than Significant)	None required.	Less than Significant
PUB-4: Implementation of the proposed 2006 LRDP would not significantly adversely affect the provision of parks and recreation. (Less than Significant)	None required.	Less than Significant
PUB-5: Under cumulative conditions, implementation of the 2006 LRDP would contribute to an increase in demand for fire protection services and police services. However, this increased demand would not result in the need for new or physically altered facilities, the construction of which could cause significant environmental impacts. (Less than Significant)	None required.	Less than Significant
PUB-6: Under cumulative conditions, implementation of the proposed 2006 LRDP would not result in the need for new or physically altered public school facilities. (Less than Significant)	None required.	Less than Significant
PUB-7: Under cumulative conditions, implementation of the proposed 2006 LRDP would not substantially affect the provision of parks and recreation facilities. (Less than Significant)	None required.	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
<p>Transportation/Traffic</p> <p>TRANS-1: Implementation of the 2006 LRDP would degrade level of service at certain local intersections. (Significant and Unavoidable)</p>	<p>TRANS-1a: LBNL shall work with UC Berkeley and the City of Berkeley to design and install a signal at the Gayley Road/Stadium Rim Way intersection, when a signal warrant analysis shows that the signal is needed. The intersection would meet one-hour signal warrants for peak-hour volume and peak-hour delay under 2025 conditions with implementation of the LBNL 2006 LRDP. LBNL shall contribute funding on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, for a periodic (annual or biennial) signal warrant check to allow the City to determine when a signal is warranted, and for installation of the signal. Should the City determine that alternative mitigation strategies may reduce or avoid the significant impact, the Lab shall work with the City and UC Berkeley to identify and implement such alternative feasible measure(s). See also Mitigation Measure TRANS-1c, development and implementation of a new Transportation Demand Management Program.</p> <p>With the implementation of this mitigation measure, the intersection of Gayley Road/Stadium Rim Way would operate at an acceptable level of service (LOS B or better under traffic signal control) during both the a.m. and p.m. peak hours. Because LBNL could not implement this measure on its own, but would need the cooperation of UC Berkeley and/or the City of Berkeley, this impact would be considered significant and unavoidable.</p> <p>TRANS-1b: LBNL shall work with the City of Berkeley to design and install a signal at the Durant Avenue/Piedmont Avenue intersection, when a signal warrant analysis shows that the signal is needed. LBNL shall contribute funding, on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, for a periodic (annual or biennial) signal warrant check to allow the City to determine when a signal is warranted, and for installation of the signal. Should the City determine that alternative mitigation strategies may reduce or avoid the significant impact, the Lab shall work with the City and UC Berkeley to identify and implement such alternative feasible measure(s). See also Mitigation Measure TRANS-1c, development and implementation of a new Transportation Demand Management Program.</p>	<p>Significant and unavoidable at (1) Hearst Avenue/Gayley Road/La Loma Avenue intersection; potentially mitigable to a less-than-significant level at (2) Gayley Road/Stadium Rim Way and (3) Durant Avenue/Piedmont Avenue intersections, but considered significant and unavoidable because LBNL could not implement the mitigation measures (installation of traffic signals, with the Lab funding its fair share of the cost) on its own, as these improvements would be under the jurisdiction of the City of Berkeley.</p>

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
<p>Transportation/Traffic</p> <p>TRANS-1 (cont.)</p>	<p>With the implementation of this mitigation measure, the Durant Avenue/Piedmont Avenue intersection would operate at an acceptable level of service (LOS B or better under traffic signal control) during both the a.m. and p.m. peak hours. Because LBNL could not implement this measure on its own, but would need the cooperation of the City of Berkeley, this impact would be considered significant and unavoidable.</p> <p>TRANS-1c: LBNL shall develop and implement a new Transportation Demand Management (TDM) Program to replace its existing TDM program. This enhanced TDM Program has been drafted in consultation with the City of Berkeley, and is proposed to be adopted by the Lab following The Regents' consideration of the 2006 LRDP. The new draft proposed TDM Program is attached to this EIR as Appendix G. The proposed TDM Program includes several implementation phases tied to the addition of parking to LBNL. The final provisions of the TDM Program may be revised as it is finally adopted but will include a TDM coordinator and transportation committee, an annual inventory of parking spaces and a gate count, a study of more aggressive TDM measures, investigation of a possible parking fee, investigation of sharing services with UC Berkeley and an alternative fuels program. The new draft proposed TDM Program also includes a requirement that LBNL conduct an additional traffic study to reevaluate traffic impacts on the earliest to occur of 10 years following the certification of this EIR or the time at which the Lab formally proposes a project that will bring total development of parking spaces pursuant to the 2006 LRDP to or above 375 additional parking spaces.</p>	
<p>TRANS-2: Implementation of the 2006 LRDP would result in minor increases in transit ridership. (Less than Significant)</p>	<p>None required.</p>	<p>Less than Significant</p>
<p>TRANS-3: Implementation of the 2006 LRDP would result in an increase in ridership on LBNL shuttle buses, including additional demand for bicycle service on the inbound shuttles, potentially causing overcrowding on the shuttle buses or an inability by bicyclists to use the shuttle buses with their bicycles. (Significant; Less than Significant with Mitigation)</p>	<p>TRANS-3: LBNL shall develop and maintain a transportation plan designed to ensure that the current balance of transportation modes is maintained. This plan shall include 1) maintaining the same (or lesser) ratio of parking permits and parking spaces to average daily population (ADP), and 2) ensuring that levels of shuttle bus service and provision of bike racks on shuttle buses are sufficient to accommodate projected demand.</p>	<p>Less than Significant</p>
<p>TRANS-4: Implementation of the 2006 LRDP would increase parking demand but would provide additional parking that would be adequate to meet this demand. (Less than Significant)</p>	<p>None required.</p>	<p>Less than Significant</p>

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Transportation/Traffic		
TRANS-5: Implementation of the 2006 LRDP would marginally increase potential traffic conflicts with pedestrians or bicyclists. (Less than Significant)	None required.	Less than Significant
TRANS-6: Construction of new facilities proposed under the 2006 LBNL LRDP would temporarily and intermittently increase traffic volumes and parking demand above current conditions. (Less than Significant)	None required.	Less than Significant
TRANS-7: Traffic associated with construction of new facilities proposed under the 2006 LBNL LRDP could contribute to the degradation of pavement on Berkeley streets. (Less than Significant)	None required.	Less than Significant
TRANS-8: Development pursuant to the 2006 LRDP, when combined with development under the UC Berkeley LRDP as well as surrounding development in Berkeley and nearby communities that could affect the study intersections, would contribute to a degradation of level of service at local intersections. (Significant and Unavoidable)	<p>TRANS-8: LBNL shall implement Mitigation Measure TRANS-1a (work with UC Berkeley and the City of Berkeley to design and install a signal at the Gayley Road/Stadium Rim Way intersection; LBNL would contribute funding on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, to install the signal) and Mitigation Measure TRANS-1b (work with the City of Berkeley to design and install a signal at the Durant Avenue/Piedmont Avenue intersection, when a signal warrant analysis shows that the signal is needed; LBNL would contribute funding on a fair-share basis, to be determined in consultation with UC Berkeley and the City of Berkeley, to install the signal and for monitoring to determine when a signal is warranted).</p> <p>With the implementation of these mitigation measure, the intersections of Gayley Road/Stadium Rim Way and Durant Avenue/Piedmont Avenue would operate at LOS B or better during both the a.m. and p.m. peak hours.</p> <p>As explained earlier, the intersection of Hearst Avenue at Gayley Road/La Loma Avenue is currently signalized, and physical geometric limitations constrain improvements within its current right-of-way. Analyses indicate that little can be done to mitigate future LOS conditions without acquiring additional right-of-way or prohibiting certain turning movements, such as minor left-turn movements. Therefore, no mitigation is available for cumulative impacts on this intersection.</p>	<p>Traffic impacts were found to be significant and unavoidable at (1) Hearst Avenue/Gayley Road/La Loma Avenue intersection. Traffic impacts were found to be potentially mitigable to less-than-significant levels at (2) Gayley Road/Stadium Rim Way and (3) Durant Avenue/Piedmont Avenue intersections, but considered significant and unavoidable because LBNL could not implement mitigation measures on its own, as these improvements would be under the jurisdiction of the City of Berkeley.</p>

**TABLE II-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Environmental Impact	Mitigation Measures	Level of Significance After Mitigation
Utilities, Service Systems, and Energy		
UTILS-1: Implementation of the proposed 2006 LRDP would increase the demand for water. (Less than Significant)	None required.	Less than Significant
UTILS-2: Implementation of the proposed 2006 LRDP would generate additional wastewater, requiring system improvements to ensure that additional wastewater flows from the Lab are directed into unconstrained sub-basins. (Significant; Less than Significant with Mitigation)	UTILS-2: LBNL shall implement programs to ensure that additional wastewater flows from the Lab are directed into unconstrained sub-basins, as necessary and appropriate. LBNL shall continue to direct the Lab's existing western effluent flows into sub-basin 17-013. In addition, new flows at the Lab shall be directed into either sub-basin 17-013, sub-basin 17-304, unconstrained portions of sub-basin 17-503, or another sub-basin that has adequate capacity. Final design and implementation of these improvements shall be negotiated between the appropriate parties and shall undergo appropriate environmental review and approval. LBNL shall closely coordinate the planning, approval, and implementation of this mitigation with the City of Berkeley and the UC Berkeley, as appropriate.	Less than Significant
UTILS-3: Development proposed under the 2006 LRDP would generate solid waste, but would not require new facilities. (Less than Significant)	None required.	
UTILS-4: On-site construction due to development proposed under the 2006 LRDP would generate construction waste and debris. (Significant; Less than Significant with Mitigation)	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.	Less than Significant
UTILS-5: Development proposed under the 2006 LRDP would create additional demand for electricity and natural gas, but would not result in the construction of new or expansion of existing energy production and/or transmission facilities. (Less than Significant)	None required.	Less than Significant
UTILS-6: The proposed 2006 LRDP, in combination with other reasonably foreseeable development in the surrounding area, would contribute to cumulative demand for utilities, service systems, and energy. (Less than Significant)	None required.	Less than Significant

CHAPTER III

Project Description

This EIR evaluates the adoption and implementation of the proposed Lawrence Berkeley National Laboratory 2006 Long Range Development Plan (2006 LRDP; also referred to herein as the CEQA “project”) through a horizon year of 2025.

III.A. Overview

The proposed project consists of a Long Range Development Plan for Lawrence Berkeley National Laboratory (LBNL; also referred to herein as the “Lab,” “Berkeley Lab,” and “Laboratory”). Development and operational activities pursuant to the 2006 LRDP include construction, development, and demolition projects and Laboratory operational, research, and maintenance activities through the planning year 2025.¹

The project site occupies 202 acres in the Oakland/Berkeley hills, on what is referred to in the EIR as the Lab’s main “hill site.” The 2006 LRDP addresses continuing and projected uses and activities on the hill site, as well as in building space occupied by the Lab in various buildings on the UC Berkeley campus and in various off-site locations, with a horizon year of 2025. The baseline assessment of building space used in this EIR was established in July 2003.

The proposed 2006 LRDP provides for construction of approximately 980,000 gross square feet (gsf) of additional research and support space, approximately 585,000 square feet of parking space (of which an estimated 372,000 square feet [64 percent] would be in parking structures for a net gain of 500 new parking spaces), and demolition of up to 320,000 gsf of building space that is or may become obsolete or that poses safety hazards. (Of the total of 320,000 gsf, approximately 50,000 gsf has already been demolished under the existing 1987 LRDP since the July 2003 baseline date for this document and approximately 270,000 gsf is projected to be demolished over the term of the approved LRDP.) Up to 600,000 gsf of renovation may take place to restore or rehabilitate existing buildings. The project would also include construction, expansion, or improvement of utility infrastructure and eight roadway improvements totaling approximately 5,800 linear feet.

¹ While the planning horizon for the 2006 LRDP is anticipated to be 2025, the LRDP could continue to be in effect beyond that year. If the LRDP continues in effect beyond 2025, any approved development pursuant to the LRDP would be required to be consistent with the LRDP, including provisions regarding development allocation, vehicle trips and parking limits.

The scope of the proposed 2006 LRDP and the amount of potential development under that LRDP have been reduced since the issuance of the Notice of Preparation for this EIR. The NOP anticipated a possible maximum of 1,240,000 gsf of new occupiable (research and support) space construction, and 440,000 gsf of demolition, leading to up to 800,000 net new gsf of occupiable space. Since the release of the NOP, however, it has become apparent to Lab staff that U.S. Department of Energy (DOE) funding priorities may limit the scope of development pursuant to the 2006 LRDP, and while it is possible that other funding sources may make up some of this difference, this reallocation of DOE priority is likely to decrease the amount of development on the main hill site. In addition, and more importantly, substantial concerns were raised by the City of Berkeley in a series of meetings regarding the amount of growth proposed under the 2006 LRDP. For both of these reasons, the Lab determined that the 2006 LRDP and the proposed project presented in this EIR should be reduced in scope to 980,000 gsf of new occupiable building space construction, with 320,000 gsf of demolition, for a net total of 660,000 gsf of new occupiable space. This is a reduction of approximately 21 percent in the amount of possible new construction of occupiable space under the 2006 LRDP, and a reduction of 17.5 percent in the amount of possible net new occupiable space. LBNL may attempt to consolidate most of its staff and operations on its main hill site. A “project variant,” in which most of LBNL’s off-site staff would be moved onto the main hill site at some point during the planning period, is analyzed in this EIR concurrent with the analysis of the 2006 LRDP.²

The 2006 LRDP contains descriptions of Berkeley Lab science and technology goals and development principles for site and facilities development. In addition, a separate, companion document, the Berkeley Lab Design Guidelines, will provide direction for physical development under the 2006 LRDP. These proposed Design Guidelines are proposed to be adopted by the Lab following The Regents approval of the LRDP. These principles, strategies, and design guidelines are listed in Appendix B and are referred to in the Project Description and the various technical sections of this EIR, as appropriate.

The University of California is exempt under Article 9, Section 9 of the State Constitution from local planning, zoning, and redevelopment regulations whenever land under its control is used for purposes within its mission. As a federal facility—a U.S. Department of Energy National Laboratory—Lawrence Berkeley National Laboratory is also exempt from local planning, zoning, and redevelopment regulations.

This project description includes the following components:

Section III.B of this chapter sets forth the baseline site conditions and characteristics for the LBNL site. This includes a description and maps of the project site, and of existing facilities and programs. This also includes a discussion of the 1987 LRDP that is currently in effect. Since the baseline for analysis was set in 2003 when the Notice of Preparation was released, this section also includes a discussion of changes in the baseline since 2003. Section III.C of this chapter describes the institutional approach, principles and strategies that are included in the proposed 2006 LRDP.

² The 2006 LRDP does not distinguish between the project and the project variant, per se, but is compatible with either scenario analyzed in this EIR.

Section III.D of this chapter describes the 2006 LRDP, including a description of potential development, the land use plan and land use zones, transportation circulation and parking improvements, open space planning, landscape and vegetation management provisions, and infrastructure and utilities requirements.

Section III.E of this chapter describes an Illustrative Development Scenario that was formulated so that this EIR could provide a greater level of disclosure of potential impacts than is normally provided in plan-level EIRs. This Scenario was used as the basis for some of the quantitative modeling that was performed to evaluate environmental impacts of potential development pursuant to the 2006 LRDP.

Section III.F of this chapter describes the required approvals for adoption and implementation of the 2006 LRDP, and the ways in which this EIR will be used in connection with those approvals.

III.B. Baseline Site Conditions and Characteristics

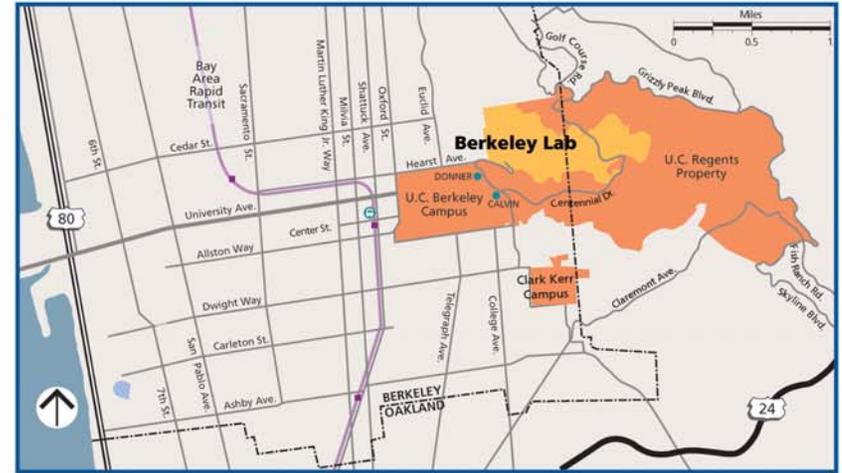
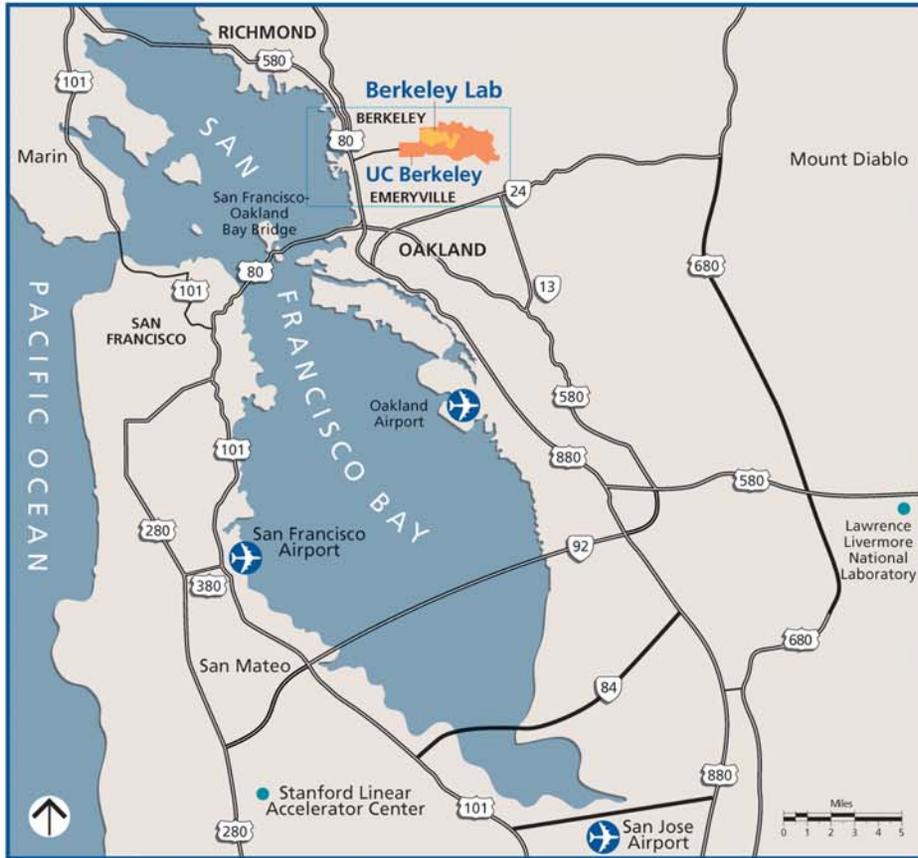
III.B.1 Project Site and Location

LBNL is located approximately three miles east of San Francisco Bay in the eastern hills of the cities of Berkeley and Oakland. The Lab occupies a 202-acre site (the main “hill site”) within 1,183 acres of contiguous land owned by The Board of Regents of the University of California (The Regents or UC Regents) (see Figure III-1).³ Building parcels on the Lab’s hill site are leased by the University to the U.S. Department of Energy (DOE) for all major DOE constructed buildings. The DOE owns most of the facilities and structures within LBNL and contracts out the management and operation of the National Laboratory to the University.⁴ The current contract between the DOE and UC extends through 2009, with renewal options through 2025.

The Lab also occupies approximately 100,000 square feet of off-site space at the UC Berkeley campus and approximately 338,000 gsf of other off-site leased spaces, mostly in Berkeley, Oakland, and Walnut Creek. (The UC Regents also own the Lab-occupied land at UC Berkeley; other off-site space is leased from private landowners.) Under the proposed 2006 LRDP, no substantial growth of lab-occupied space on the UC Berkeley campus is planned, although the buildings occupied may change over time. Existing LBNL research on the UC Berkeley campus in Donner and Calvin Laboratories operates under the memorandum of understanding between UC Berkeley and LBNL concerning Environmental, Health And Safety Policy and Procedures, as would any future space occupied in place of Donner and Calvin Labs at UC Berkeley.

³ Approximately 975 acres of adjacent UC Regents land is managed by the University of California, Berkeley.

⁴ Recently DOE has begun encouraging its contractors to assist in providing facilities for the National Laboratories through third-party financing. In this manner, DOE will lease buildings on a site that may have been be constructed by the University or other parties. DOE may issue a Statement of Mission need for the construction of the facilities, and it enters into lease agreements for the occupancy. The potential physical and environmental scope of any third-party financed facilities within the 202-acre LBNL main hill site is included in the proposed LRDP and this EIR.



- UC Regents Property
- Berkeley Lab

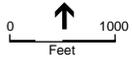
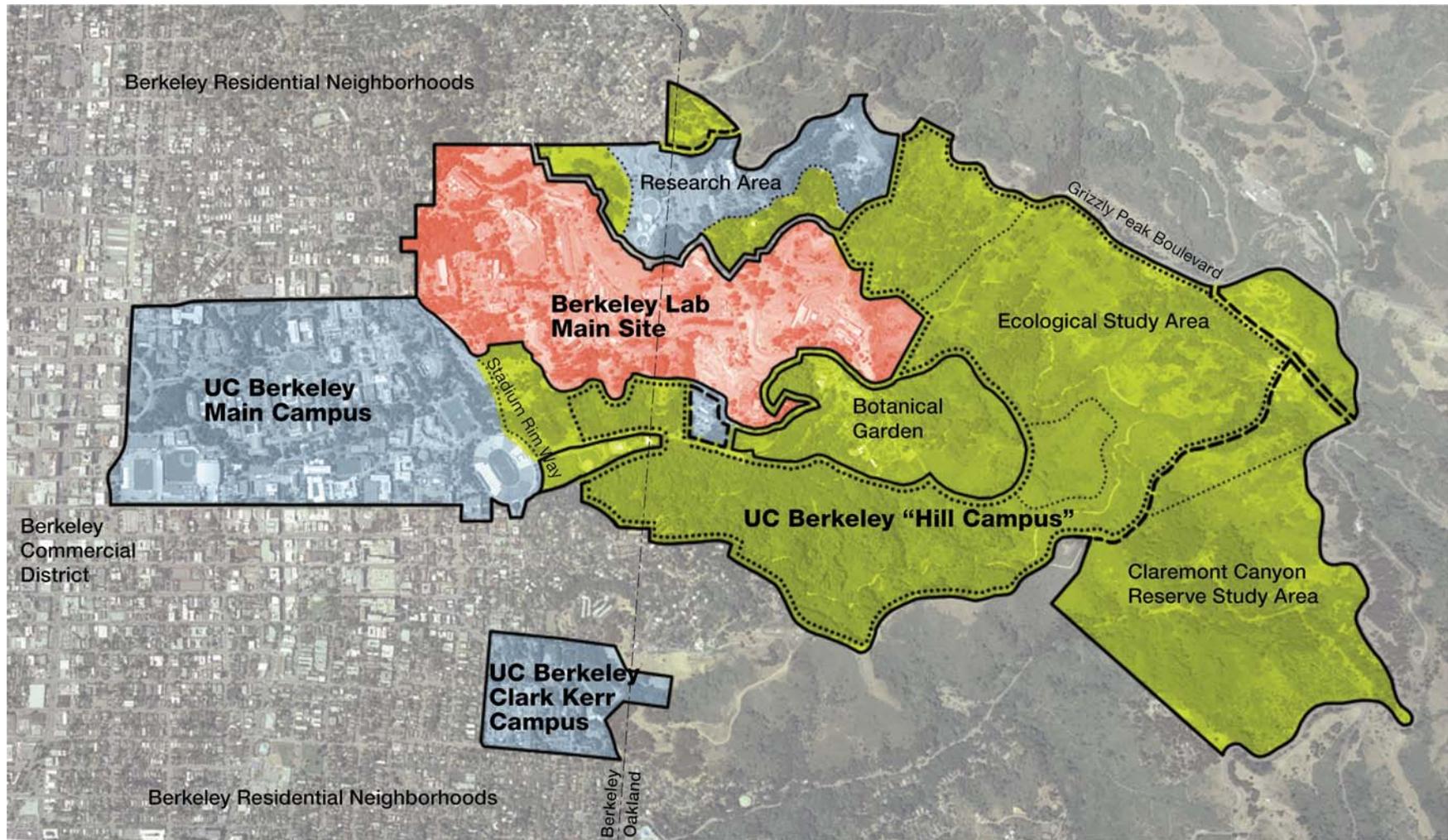
The Regents do not own, but lease and control, along with DOE, the approximately 338,000 square feet of LBNL space leased on the commercial market off of the main LBNL hill site. Under the 2006 LRDP, no substantial growth of commercial lease space is planned. However, as with space at UC Berkeley, the actual space used may change over time.

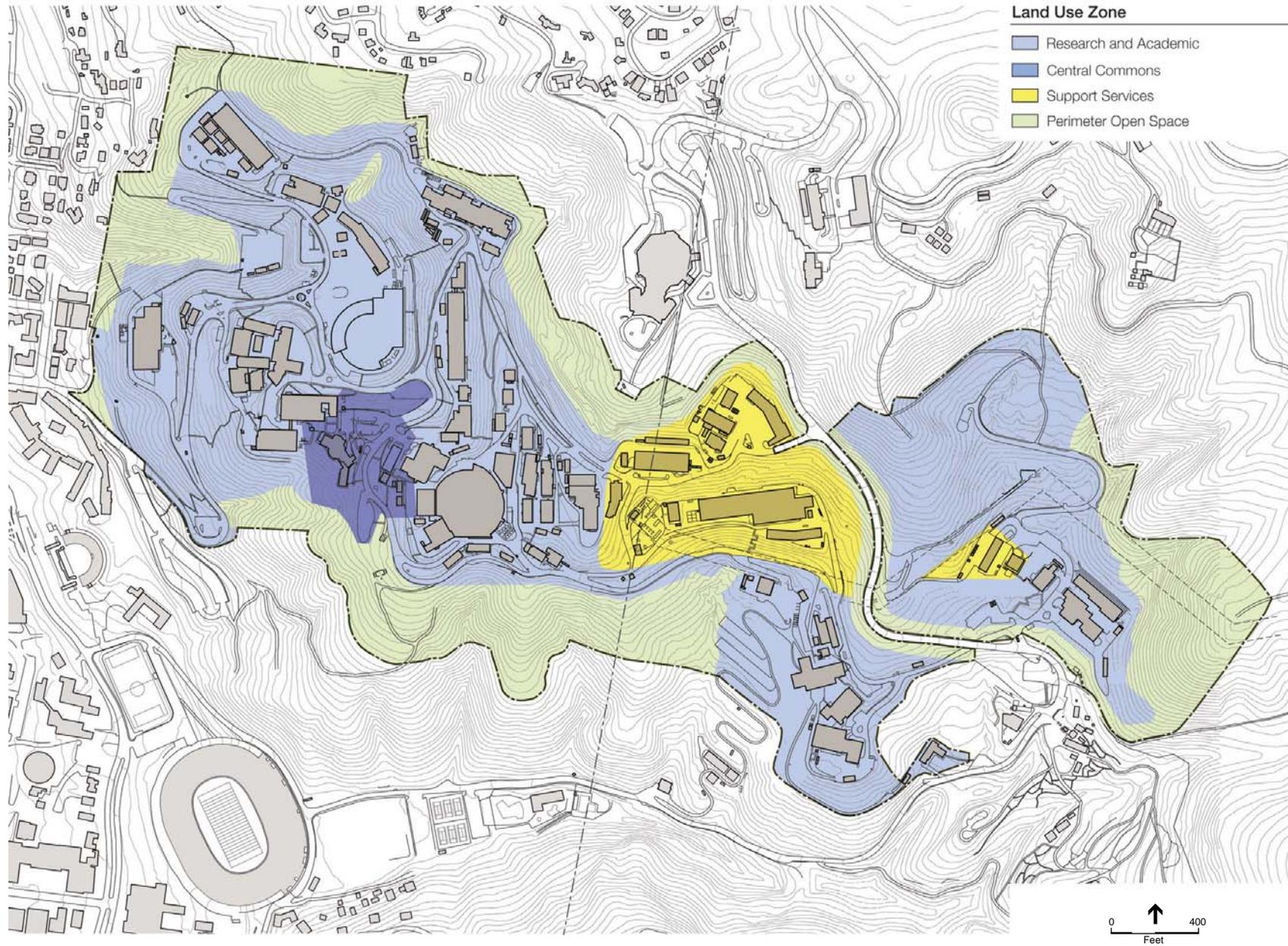
The LBNL site is a developed area that lies between UC Berkeley and residential neighborhoods of the City of Berkeley to the west and northwest. The UC Berkeley corporation yard, UC Berkeley recreation pools, sports fields, and walking trails, the UC Berkeley–managed Ecological Study Areas and the UC Berkeley Botanical Garden lie to the south, southeast, and east; and UC Berkeley–operated research and educational facilities lie to the northeast. Although developed, the LBNL site retains substantial vegetation and natural topographic features. Berkeley Lab is fenced for security and controlled access. As occurred under the 1987 LRDP, it is possible following adoption of the 2006 LRDP that there might be changes in operational and jurisdictional control over some parts of the Berkeley Lab site; for example, it is possible that a facility might be proposed to be jointly operated by UC Berkeley and the Lab. If such changes are proposed, the location of boundary and security fencing may change accordingly. No such joint operations or changes are currently proposed, although it is possible that joint operation will be proposed for the Helios Research Facility, which is currently anticipated to be proposed and review under CEQA in 2008.

Figure III-2 depicts the Lab in the context of surrounding land uses. As described above, the Lab also occupies space at the UC Berkeley campus, a public educational institution attended by approximately 32,000 graduate and undergraduate students.⁵ In addition to the 180-acre UC Berkeley main campus, UC Berkeley also includes areas of Strawberry Canyon southeast of LBNL, as well as the University’s “Hill Campus” to the east. The Lawrence Hall of Science is within this area, as are the Botanical Garden, the Silver Space Sciences Laboratory, and the Mathematical Sciences Research Institute, as well as large expanses of natural open space, including over 300 acres in the Ecological Study Area. The UC Berkeley Hill Campus also includes Strawberry Canyon Recreation Area and the adjacent Witter and Levine-Fricke sport fields. West and north of LBNL are residential neighborhoods within Berkeley; another residential neighborhood, Panoramic Hill, lies within both the cities of Berkeley and Oakland, across Strawberry Canyon to the south of the Lab. Regional open space lies beyond the UC Berkeley Hill Campus, including the 2,000-acre Tilden Regional Park to the northeast and east, and the 205-acre Claremont Canyon Regional Preserve to the south. Finally, the proposed project area includes off-site space leased by the University from private or public property owners.

The location and boundaries of LBNL are shown in Figure III-2 and Figure III-3, which portrays the proposed land use map for the 2006 LRDP evaluated in this EIR. The 2006 LRDP’s proposed land uses are described later in this chapter.

⁵ Land use at UC Berkeley, including facilities occupied by LBNL, is governed by UC Berkeley’s 2020 LRDP.





SOURCE: LBNL, 2006

LBNL 2006 Long Range Development Plan . 201074

Figure III-3
LRDP Land Use Map

III.B.2 Existing Facilities and On-Site Uses⁶

III.B.2.1 Historical Background

LBNL was established in 1931 when UC President Robert Gordon Sproul assigned a building for cyclotron research to Ernest O. Lawrence, a member of the UC Berkeley faculty. The Lab began on the UC Berkeley campus, but quickly expanded its facilities to other locations on the campus. In 1940, the first building was constructed in the Oakland-Berkeley hills—the prominent dome-covered 184-inch cyclotron, now the Advanced Light Source (Building 6), a familiar Berkeley Hills landmark. From this structure, LBNL has evolved to become a multi-program national laboratory with uses including laboratories, office space, research facilities, and support services. Under 14 scientific divisions,⁷ Berkeley Lab staff perform research in the computing sciences, life and earth sciences, energy sciences, biosciences, and general sciences in a manner that ensures employee and public safety and environmental protection; develop and operate unique national experimental facilities for qualified investigators, including five “national user facilities”⁸ that host visiting researchers; educate and train future generations of scientists and engineers to promote national science and education goals; and disseminate knowledge to users nationwide, fostering productive relationships between LBNL’s research programs and other research institutions and industry. (More discussion on historical background is available in “Berkeley Lab: Historical Perspective,” in the 2006 LRDP.)

III.B.2.2 Building Space

LBNL’s research and support activities are conducted in structures occupying a total of 2.2 million square feet, of which approximately 1.76 million square feet are located on the main hill site, 100,000 square feet on the UC Berkeley campus, and 340,000 square feet at other locations, including leased space in Berkeley, Oakland, Walnut Creek, and Washington D.C. (Although LBNL and UC Berkeley operate independently from one another, they do interact through cooperative research and joint appointments of some researchers.)

The main hill site has more than 150 buildings, many originally built as “temporary” single-purpose structures, more than 60 percent of which are more than 40 years old.⁹ Across the Laboratory are terraces that serve as centers of development. Some areas of development, such as Building 90, the Building 71 complex, and the Building 66/62 complex, cluster activities on plateaus, while other areas, like the Building 84 complex and the Building 51 area, are located within relatively level hollows. In some areas, like the Building 77 complex and the Building 46 area, the terraces are linear, parallel with the natural hillside contours and the roadways along the contour lines.

⁶ Building space and population figures in this section refer to the 2003 baseline and are rounded.

⁷ Berkeley Lab’s research divisions include the Life and Environmental Sciences Divisions: Earth Sciences, Genomics, and Life Sciences; the Physical Sciences Divisions: Advanced Light Source, Chemical Sciences, Environmental Energy Technologies, Material Sciences, and Physical Biosciences; the Computing Sciences Divisions: Computational Research, and National Energy Research Scientific Computing Center; and General Sciences Divisions: Accelerator and Fusion Research, Engineering, Nuclear Science, and Physics.

⁸ LBNL National User Facilities are the Advanced Light Source, the National Center for Electron Microscopy, the National Energy Research Scientific Computing Center, the Energy Sciences Network, and the Molecular Foundry.

⁹ A figure depicting conditions of existing buildings on the Lab’s main hill site is provided in Appendix D.

Approximately one-third of the LBNL site is covered by impervious surfaces, including buildings, roads, and parking lots, while the remaining two-thirds of the site is pervious or otherwise not paved. The latter areas contain a variety of ornamental plants and native and non-native grasses, brush, and woodlands. Native trees, including oak and bay laurel, are present, along with non-native trees such as eucalyptus, pine, fir, and others. The impermeable areas also include utility corridors, some service roads, trails, chemical and radiation monitoring stations, sewers, hydraugers,¹⁰ and drainage ditches.

Much of LBNL's research space on the UC Berkeley campus (approximately 40,000 square feet) is in the Donner and Calvin laboratory buildings. The amount of space used by LBNL on the UC Berkeley campus fluctuates from year to year, but does not exceed 100,000 square feet. A portion of LBNL's research and support staff is located in commercial leased space off-site, away from both the LBNL hill site and the UC Berkeley campus. The amount of leased space fluctuates from time to time based on the Lab's space needs and market conditions.

III.B.2.3 Population

Under baseline conditions, LBNL employed approximately 3,800 people, including about 1,400 scientists and engineers, 500 administrative staff, and 1,900 technical and support staff. An estimated 2,500 guest researchers visit LBNL each year. This translates into an adjusted daily population (ADP)¹¹ of approximately 4,375. Of this total, some 4,000 are on the main hill site and in laboratory space on the UC Berkeley campus.¹² Research staff in leased space in downtown Oakland and in Walnut Creek constitute an ADP of approximately 100 (about 50 at each location), and administrative staff in leased office space in downtown Berkeley constitute an ADP of about 225. About 50 ADP represent research staff who work in other remote locations.

III.B.2.4 Access, Circulation, and Parking

Lawrence Berkeley National Laboratory is approximately three miles east of Interstate 80, the nearest major freeway, and five miles northeast of the San Francisco-Oakland Bay Bridge. Vehicular access to the site occurs primarily along two routes: Hearst Avenue, which borders the north edge of the UC Berkeley campus and becomes Cyclotron Road at Gayley Avenue; and

¹⁰ Hydraugers are in-hill drainage pipes installed at locations throughout the Lab to draw groundwater out of the hillside and prevent saturation of the soil that otherwise could lead to slumps and landslides.

¹¹ ADP represents the actual number of people at the Laboratory's main hill site, in Berkeley Lab space on the UC Berkeley campus, and in leased facilities on any given day. It is calculated by combining the Lab's full-time-equivalent employment, which totals approximately 3,400, with approximately 40 percent of the annual average number of registered guests (i.e., the guest researchers assumed present on any given day, along with vendors and construction contractors working on the site). The percentage of guests on-site will be periodically reviewed and this ADP factor periodically updated during the term of the LRDP. However, the total ADP of 5,525 allowed by the 2006 LRDP would not be modified without a formal amendment of the LRDP.

¹² Under baseline conditions, about 3,650 ADP are on the main hill site, while research staff on the UC Berkeley campus constitute an ADP of about 350. Many LBNL staff working at UC Berkeley hold "joint appointments" at both institutions; therefore, some travel to (and, if driving, park at) UC Berkeley, while others travel to (and, if driving, park at) LBNL and use the Lab shuttle to reach the UC Berkeley campus. These staff may also travel (generally by shuttle) between the two institutions.

Centennial Drive, which extends from Memorial Stadium through Strawberry Canyon to the Lawrence Hall of Science and Grizzly Peak Road. These roadways provide access to three controlled points of entry (Blackberry Canyon Gate on Cyclotron Road, Strawberry Canyon Gate on Centennial Drive, and Grizzly Peak Gate on Centennial Drive), all of which are staffed by security personnel. Grizzly Peak Gate is currently used as an entry gate during the morning commute hours, although it is available as an egress point at all times. One additional gate at “PG&E Point” provides ingress/egress to the Laboratory site for maintenance operations and emergency access. Additional pedestrian access is provided through additional pedestrian-only gates.

Circulation within the Lab site is primarily via two east-west roadways and connecting north-south roadways (Chamberlain Road and McMillan Road make up the primary “upper route” and Lawrence and Alvarez Roads form the “lower route”). Accompanying pathways and a series of connecting roadways, paths, stairways, and elevators allow staff and visitors to move among the Lab’s buildings.

The main hill site provides approximately 2,300 permit parking spaces to qualifying Lab personnel and guests. These spaces are located primarily in lots distributed around the LBNL site where space was available and alongside Lab roadways, with the result that parking locations do not match the distribution of personnel. Additionally, as of 2003, LBNL leased approximately 135 parking spaces in downtown Berkeley that are assigned to designated employees working in leased office space, and the Lab maintains approximately 10 parking spaces at the Calvin and Donner laboratory buildings on the UC Berkeley campus. Parking spaces provided at buildings leased at other locations are not included in this analysis. LBNL operates a free intra-site shuttle service for employees and visitors on the hill site, and off-site between LBNL and the UC Berkeley campus, the downtown Berkeley and Rockridge BART stations, and AC Transit connections.

III.B.2.5 Utilities

The Lab maintains its own on-site utility distribution network for potable water (supplied from off-site by the East Bay Municipal Utility District [EBMUD]), including water for fire protection, sanitary sewer (connecting to City of Berkeley facilities and eventually to EBMUD mains and treatment plant), stormwater, electricity (supplied by the Western Area Power Administration over Pacific Gas & Electric lines), and natural gas (supplied by the Defense Fuel Supply Center via the Pacific Gas & Electric pipes). LBNL also employs several building specific or site-wide utilities, including a compressed air system, a low-conductivity water system, a closed-loop cooling water system, a purified water system, and a de-ionized water system, to accommodate research or specialized equipment.

III.B.2.6 Landscape and Vegetation Management

The Laboratory’s vegetation management program was instituted in its current form in 1992 in response to the Oakland/Berkeley East Bay Hills Fire of 1991. Under the program, on-site vegetation is managed to minimize potential wildland fire damage to structures through an annual

program of removing tree limbs a minimum of six to eight feet from the ground, mowing or grazing grasses, removing all brush from most vegetated areas of the site, and planting ornamental species near buildings for fire safety. The vegetation management program also encourages use of native plants. Under the program, the Lab has removed a number of invasive exotic plants, including French broom, artichoke thistle, cape ivy, and pampas grass. Eucalyptus and other tree stands across the site are continually removed or thinned and native grasses are used in erosion control. Trees at the Laboratory are also managed as part of a larger urban forest, with thinning and replacements made to promote long-term health of the stands.

III.B.2.7 Research

The Laboratory's principal role for DOE is to promote fundamental science, including developing powerful experimental and computational systems for exploring properties of matter, deepening understanding of molecular interactions and synthesis, and gaining insights into biological molecules, cells, and tissues. The Laboratory is a major contributor of research on energy resources, including efficient energy use, the earth's structure and energy reservoirs, fusion, and cleaner combustion of fuels, as well as environmental research, subsurface contaminant transport, bioremediation, and indoor air quality. Research programs include computational research, information technologies, chemical sciences, materials sciences, physical biosciences, earth sciences, life sciences, accelerator and fusion research, nuclear science, and basic physics. User facilities include the Advanced Light Source, National Energy Research Scientific Computing Center, National Center for Electron Microscopy, and Energy Sciences Network (ESnet). The Laboratory's multidisciplinary research environment and unique location serve to strengthen partnerships with industry, universities, and government laboratories. Partnerships include the Joint Genome Institute and programs in advanced accelerator and detector systems, x-ray lithography, high-speed networking and computer architectures, building and lighting systems, and science education.

During the 20-year term of the 2006 LRDP, Berkeley Lab would continue to engage in scientific research and activities on the main hill site. This work would include continued bench top laboratory research; employment of large scientific equipment, such as accelerators, lasers, microscopes, sensors, detectors, fabricators, biotechnical equipment, supercomputers, and a variety of other machinery; field work to collect data, observe and interact in remote or natural settings; and collaborative assistance to other institutions and organizations.

LBNL researchers also participate in various activities at off-site locations, including field research. Prior to its initiation, such research is evaluated by the Laboratory to determine whether any significant environmental effects could occur, as well as whether such activities comply with all applicable state and federal regulations, laws, and CEQA. Among such off-site activities that might occur in California and continue over the span of the 2006 LRDP are materials properties investigations at the Low-Background Facility at the Oroville Dam; geophysics field research at oil and gas fields and at the Richmond Field Station of the University of California; research into indoor air pollutants and outdoor emissions, energy-efficient windows, geothermal and fossil

energy resources, and wetlands at various locations; and field-testing of bioremediation methods in already contaminated environments, such as municipal landfills.¹³

Lab staff provide administrative and support services in areas including engineering, environmental, health and safety programs, facilities maintenance and planning, public and community affairs, animal care, site administration, information technology, and finance.

III.B.3 1987 Long Range Development Plan

Development of the main LBNL site is currently guided by the 1987 LRDP. If the 2006 LRDP is approved, it would replace the 1987 LRDP. The environmental effects of growth under the 1987 LRDP were analyzed in a corresponding *Site Development Plan Draft and Final Environmental Impact Report*. Additional CEQA documents that analyzed the effects of incremental growth at the LBNL site were adopted in 1992 and 1997. These are collectively known as the 1987 Long Range Development Plan (1987 LRDP) EIR, as amended:

- *Site Development Plan EIR*, August 1987 (State Clearinghouse No. [19]85112610);
- *Proposed Renewal of the Contract between the United States Department of Energy and The Regents of the University of California for Operation and Management of the Lawrence Berkeley National Laboratory* (Supplemental EIR), September 1992 (State Clearinghouse No. [19]91093068); and
- *Proposed Renewal of the Contract between the United States Department of Energy and The Regents of the University of California for Operation and Management of the Lawrence Berkeley National Laboratory* (Supplemental EIR Addendum), September 1997 (State Clearinghouse No. [19]91093068).

Proposed projects tiered from the 1987 LRDP EIR, as amended, were analyzed in accordance with Sections 15152 and 15168 of the CEQA Guidelines and Public Resource Code Section 21094. The 1987 LRDP EIR, as amended, is a Program EIR, prepared pursuant to Section 15168 of the CEQA Guidelines (Title 14, California Code of Regulations, Section 15000 et seq.). The 1987 LRDP EIR, as amended, analyzes full implementation of uses and physical development proposed under the 1987 LRDP through the year “20XX,” which is an indeterminate horizon year flexibly projected to occur within the current century. Measures are identified in the 1987 LRDP EIR, as amended, to mitigate the significant adverse project and cumulative impacts associated with that growth.

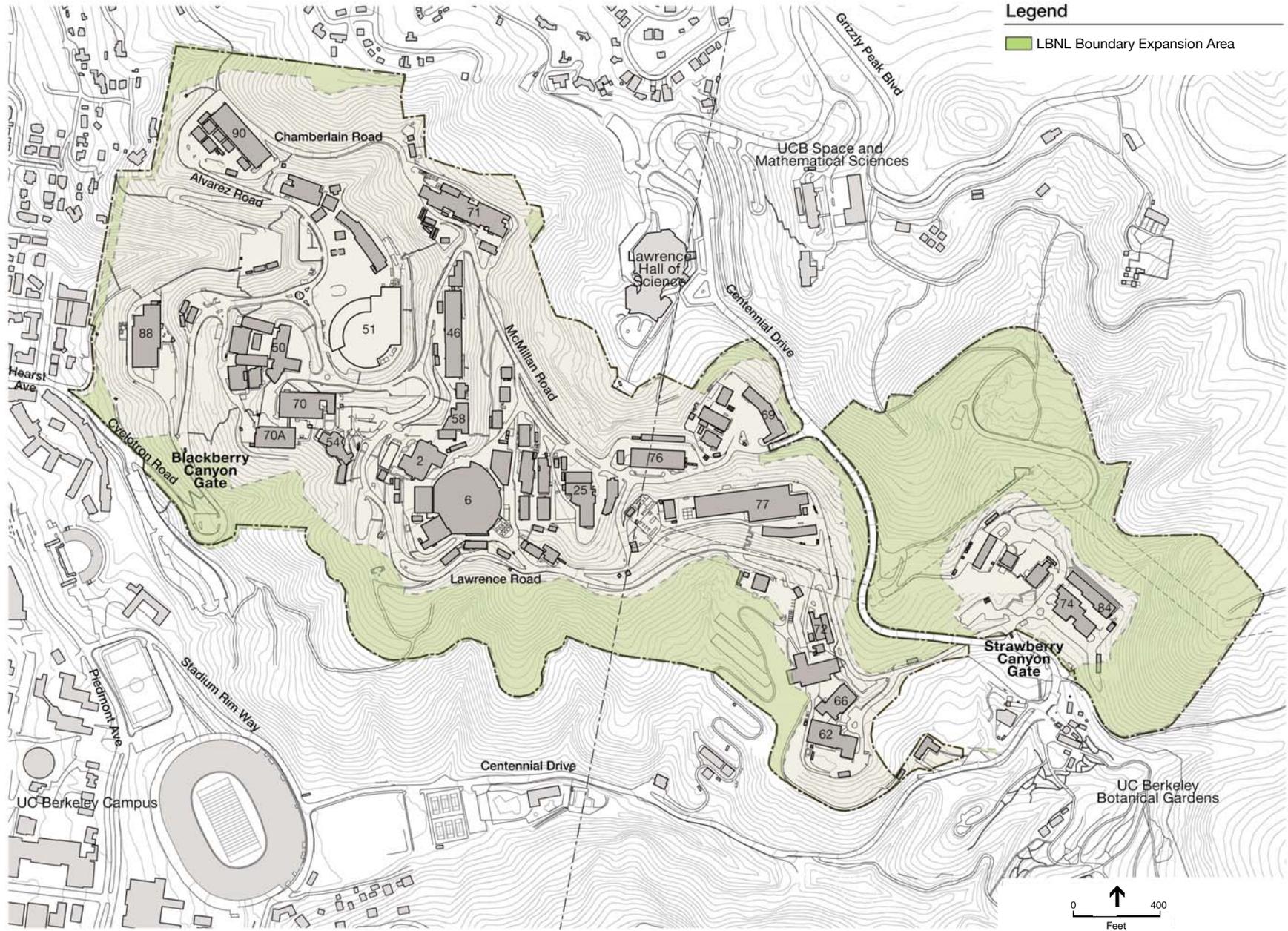
¹³ Assessment of the environmental impacts of University of California activities conducted outside of California is not required under CEQA provided that such activities would be subject to review under the National Environmental Policy Act (NEPA) or a similar law of the state involved. Public Resources Code Section 21080(b)(14); CEQA Guidelines Section 15277. The one notable exception to this applies to emissions or discharges that would have a significant effect on the environment of California. Public Resources Code Section 21080(b)(14); CEQA Guidelines Section 15277. LBNL or other institutions conduct such reviews of projects taking place outside of California in which LBNL researchers are involved. To date, none of these projects has raised the possibility of a reasonably foreseeable significant effect on the California environment, and CEQA review has not been required.

Since the 1987 LRDP was published, Berkeley Lab has increased in size from 134 acres to 202 acres, primarily due to the transfer of two areas of UC Regents land to LBNL from UC Berkeley in order to permit Berkeley Lab to more effectively manage vegetation at its perimeter for wildland fire control. The majority of this approximately 68 acres has been added in two general areas (see Figure III-4). The first area is along the southern and western perimeter of the Lab where LBNL adjoins the UC Berkeley campus; here, the Lab has assumed jurisdiction over a portion of undeveloped and developed land ranging between approximately 20 and 500 feet in width. This land extends north of Building 71, westerly around the perimeter of the Building 90 area, south of Building 88, immediately west of the horseshoe curve of Cyclotron Road at the Lab's Blackberry entrance, and across the Berkeley-Oakland border to the curve of Lee Road around the southern edge of Building 62. The second area is at the eastern edge of the Lab, where LBNL has assumed control of an approximately 1,000-foot perimeter of generally undeveloped land to the north and east of the Lab's Strawberry Cluster (Buildings 74, 83, 84, 85, and 85B). In addition, LBNL has jurisdiction of land on both sides of Centennial Drive where it ascends towards the Lawrence Hall of Science (excepting a five-foot maintenance zone on each side of the road, which is retained by UC Berkeley). Although it passes through the Lab's perimeter, Centennial Drive crosses above internal Lab roadways via an overpass and thus does not provide uncontrolled access to LBNL.¹⁴

The 1987 LRDP described growth and development that could be reasonably projected at the time of that plan's preparation. The 1987 LRDP accommodated an ADP of 4,750 as well as 1,996,200 gsf of building space at the main LBNL hill site, consistent with LRDP policies (see Figure III-5). As stated above, the EIR for the 1987 LRDP, as later amended, assumed that these conditions would occur by an unspecified date in the 21st century (identified as "20XX" in the document). Major buildings developed at LBNL under the 1987 LRDP include Buildings 84 and 85, in addition to two approved projects not yet constructed at the time of issuance of the Notice of Preparation (NOP) for this 2006 LRDP EIR – the Molecular Foundry and Building 49. The Molecular Foundry has been completed and began preliminary operations in early 2006. There are no current plans to move forward with Building 49 during the term of the 2006 LRDP planning period.

The 1987 LRDP identified general land use categories for LBNL activities on the main hill site and for off-site locations including office, laboratory, shop, and storage areas. The 1987 LRDP focused on several core planning principles, the most central of which was the consolidation of related research activities into "functional planning areas" designed to enhance interaction and efficiency at LBNL's hill site. The functional planning areas were organized along an east-west circulation and utilities axis, which generally extends from the 88-Inch Cyclotron Research Area

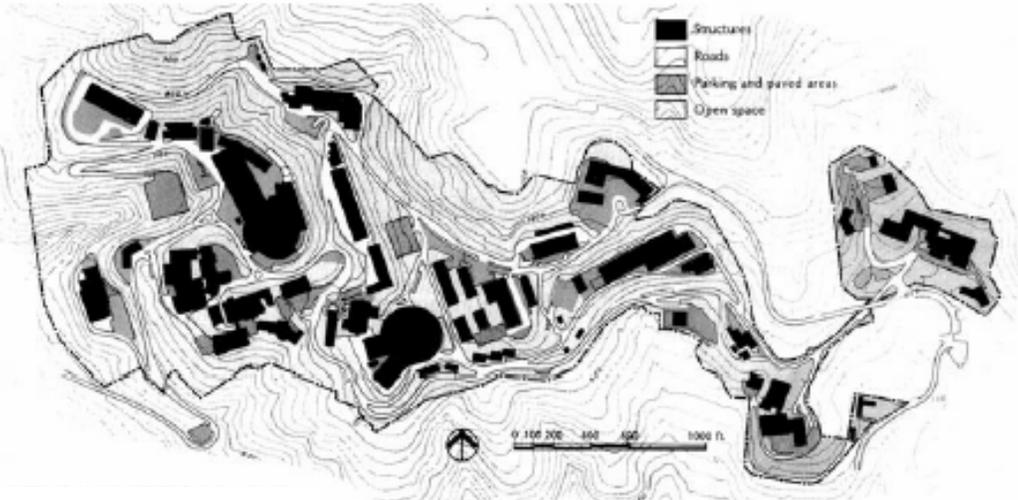
¹⁴ Berkeley Lab is fenced for security and controlled access. As occurred under the 1987 LRDP, it is possible following adoption of the 2006 LRDP that there might be changes in operational and jurisdictional control over some parts of the Berkeley Lab site; for example, it is possible that a facility might be proposed to be jointly operated by UC Berkeley and the Lab. If such changes are proposed, the location of boundary and security fencing may change accordingly. No such joint operations or changes are currently proposed, although it is possible that joint operation will be proposed for the Helios Research Facility, which is currently anticipated to be proposed and reviewed under CEQA in 2008.



SOURCE: LBNL, 2006

LBNL 2006 Long Range Development Plan . 201074

Figure III-4
Areas Added to LBNL Since 1987 LRDP



LBNL LRDP EIR / 201074 ■

Figure III-5
Land Use Plan from 1987 LRDP

to the Life Sciences Research Area. Natural buffer zones were used to separate the planning areas and provide screening of LBNL from adjacent communities. The functional areas depicted in the 1987 LRDP are as follows:

- **88-Inch Cyclotron Research Area**, including the building housing this accelerator, beam halls, and offices; cooling towers and utility buildings; and a parking lot.
- **Central Research and Administration Area**, housing research scientists, most of the management functions of the Laboratory, centralized computers, and communications. Most visitors come to this location, which contains the cafeteria, an auditorium, and conference rooms.
- **Bevalac Accelerator Complex**, located near the Administration Area, which at the time of the 1987 LRDP accommodated this accelerator, with offices for scientists and engineers.
- **Light Source Research and Engineering Area**, including the Advanced Materials Laboratory and engineering support areas.
- **Shop and Support Facilities Area**, including engineering shops and material management.
- **Materials and Chemistry Research Area**, containing laboratories, the Surface Science and Catalysis Laboratory, and the National Center for Electron Microscopy.
- **Life Sciences Research Area**, containing biomedical sciences research facilities.

The 1987 LRDP proposed concentration of new development on infill sites at the core of the Lab, allowing a greater percentage of the site perimeter to be reserved as open space. The 1987 LRDP also reinforced the importance of landscape criteria and planning.

III.B.4 Changes in Baseline Conditions Since 2003

The CEQA Guidelines (Section 15125) require that an EIR describe the environmental conditions in the project vicinity as they existed at the time the Notice of Preparation (NOP) for the project was published. The Guidelines state that “this environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant.” LBNL issued the NOP for the proposed 2006 LRDP on October 28, 2003, and therefore this EIR uses 2003 as the baseline year for evaluating the project’s impacts on its environmental setting. To provide a conservative analysis, however, this EIR selectively uses more recent (post-2003) data, where appropriate and where using such data does not make the analysis less conservative. This section identifies the incremental changes that have occurred at LBNL between commencement of CEQA analysis of the proposed 2006 LRDP in 2003 and the present.

III.B.4.1 Population

Since the Notice of Preparation (NOP) was issued for this EIR in 2003, the Lab’s adjusted daily population (ADP) peaked at approximately 4,650 in 2004 and has since declined to about 4,515 in 2006. Since 2003, there has been a decrease in Lab staff, with full-time equivalent staff levels having declined by about 10 percent. However, this decrease has been offset by an increase in annual visitors such that the ADP has increased, but only slightly – by approximately 3 percent. This short-term change in ADP is considered to be a part of the normal fluctuation in the Lab’s population cycle and, for purposes of impact analysis, has not resulted in a meaningful change, compared with the 2003 baseline setting.

III.B.4.2 Building Space

Construction and Demolition

Since the NOP was issued in 2003, the Molecular Foundry was approved under the 1987 LRDP and LRDP EIR, as amended, and has been constructed and began preliminary operations in early 2006.¹⁵ The Negative Declaration for the Molecular Foundry did not identify any significant impacts from either construction or anticipated operation of that facility that could not be mitigated to a less than significant level. Although operational, the Molecular Foundry is included as part of the 2006 LRDP “project” that is analyzed in this EIR, because the building was not operating when the EIR analysis was begun in 2003.

Minor new projects have also been developed on the hill site: in 2003, two small construction projects were undertaken that added approximately 2,150 gsf to the main hill site. Building 71T, the Window Test Facility, is a 950-gross-square-foot structure that allows for installation and testing of various building window materials. The second construction was an addition of 1,200 gsf of laboratory space inside the existing Building 64 high bay. These projects, tiered from the 1987 LRDP EIR, as amended, have likewise resulted in no meaningful changes to the 2003 setting.

¹⁵ CEQA documentation for this facility was included in the *Final Tiered Initial Study Checklist and Mitigated Negative Declaration for the Construction and Operation of the Molecular Foundry at Ernest Orlando Lawrence Berkeley National Laboratory, Berkeley, California*, State Clearinghouse No. 2002122051 (April 2003).

Berkeley Lab also demolished a small number of structures between 2003 and 2006, removing a total of approximately 50,000 gsf in building space on the hill site (most of which was included in Building 51B, the External Particle Beam Hall) in projects undertaken under the 1987 LRDP and LRDP EIR, as amended. However, because they existed when the analysis was undertaken for this EIR, these facilities are considered as part of the baseline setting. Appendix C lists facilities demolished since preparation of the NOP.

Approved Projects

Building 49 Office Building

In addition to the Molecular Foundry, discussed above, another project has been approved under the 1987 LRDP and LRDP EIR, as amended since issuance of the 2003 NOP – an office building known as Building 49.¹⁶ Building 49 received CEQA and design approvals from the UC Regents in 2003 with construction initially scheduled to begin in 2004. However, there are no current plans to move forward with this project during the 2006 LRDP planning period, and it is not considered reasonably foreseeable and therefore has not been included in this EIR analysis.

Demolition of Building 51 Complex

On October 21, 2005, Berkeley Lab circulated for public review a Draft EIR 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. Certification of the Building 51 (Bevatron) EIR and approval of the demolition project are anticipated to be considered in early 2007. The Bevatron removal would likely take place between approximately 2008 and 2012 or later. For purposes of this EIR, the Building 51 complex is considered part of the baseline setting because the buildings were in place when the EIR analysis was begun. Building 51 complex demolition activities are therefore included as part of the project analyzed in this EIR. In general, this results in a more conservative analysis, because it burdens the 2006 LRDP with impacts from a separate project that may proceed independently of the 2006 LRDP program.¹⁷

The approximately 180-foot-diameter Bevatron was constructed as a proton synchrotron – a particle accelerator that accelerated protons within a beam pipe to near the speed of light. During its operation from 1954 until 1993, the Bevatron was among the world's leading accelerators. Building 51 is a large, approximately 126,500-gross-square-foot steel-frame shed-like structure built to shelter the Bevatron apparatus and its associated mechanical, electrical, ship, and office functions. Under the proposed Bevatron demolition project, the Bevatron apparatus would be disassembled, Building 51 and the foundation underneath the building demolished, and the resulting debris and other materials removed. The site would then be backfilled, and the fill compacted and leveled. There are no current plans for future development of the underlying site. Demolition would entail the removal of approximately 22,000 to 26,000 tons of reinforced

¹⁶ CEQA documentation for Building 49 was undertaken in the *Construction and Operation of the Building 49 Project Final Environmental Impact Report*, State Clearinghouse No. 2003062097 (December 2003).

¹⁷ Bevatron Demolition CEQA and NEPA documents are available at the City of Berkeley Main Public Library and on-line at <http://www.lbl.gov/Community/env-rev-docs.html>

concrete, structural steel, siding, glass, and other building materials; 12,000 to 16,000 tons of reinforced concrete shielding blocks; and 12,000 to 15,000 tons of Bevatron materials, mostly metals, such as yokes, support steel and equipment.

Animal Care Facility

In August 2005, a categorical exemption was prepared for construction of the Animal Care Facility, a 7,100-gross-square-foot structure that will house mice used in research and that are currently housed in Building 74. Construction of this project is now under way and is expected to be completed in mid-2007. Although the project is tiered from the 1987 LRDP, as amended, building space associated with this small structure is included as part of the project in this EIR analysis.

Planned Projects

Building space for two planned projects under consideration – the Guest House and the User Support Building – are included as part of the 2006 LRDP evaluated in this EIR. However, the User Support Building has been made the subject of a mitigated negative declaration, pursuant to the 1987 LRDP and the 1987 LRDP EIR, as amended, that was circulated for public review in late 2006 and will be presented to The Regents for consideration in mid-January 2007. It is anticipated that the Guest House will also undergo a separate CEQA analysis pursuant to the 1987 LRDP and LRDP EIR, as amended (see descriptions below). Nevertheless, both projects are included within this analysis in order to provide a complete disclosure of environmental impacts of actions since the 2003 baseline date for the analysis. These projects are consistent with the Illustrative Development Scenario (see p. III-37) and are described briefly as follows.

- **User Support Building:** This proposed three-story, approximately 30,000-gross-square-foot building would consist of assembly space, support laboratories, and offices in support of the Advanced Light Source user facility at LBNL. An Initial Study/Negative Declaration for CEQA and a NEPA Categorical Exclusion were prepared and circulated November 2006. At that time, a NEPA categorical exclusion was adopted for this project by DOE. If approved, this building would occupy space currently occupied by Building 10, which is obsolete and would be demolished. Demolition and construction would take place between early 2008 and mid-2010.¹⁸
- **Guest House:** This proposed three-story, approximately 25,000-gross-square-foot building would hold up to 120 beds for visiting researchers and other guests of LBNL. An Initial Study/Negative Declaration is expected to be prepared and circulated in winter 2006 – 2007. If this project were approved, construction would take place between late 2007 and early 2009. The Guest House would be constructed near the Advanced Light Source, the Lab's largest user facility. It would use existing utilities infrastructure in the vicinity.

¹⁸ User Support Building CEQA documents are available at the City of Berkeley Main Public Library and on-line at <http://www.lbl.gov/Community/env-rev-docs.html>

Two additional projects are anticipated to be under consideration at some point in the future pursuant to the 2006 LRDP EIR and are included as part of the reasonably foreseeable future development under the 2006 LRDP that is evaluated in this EIR. These projects are the Computational Research and Theory (CRT) Building and the Helios Research Facility. The planning, design, and proposed funding for these projects has not yet proceeded to the point where they can be described in substantial detail, or proposed as specific projects pursuant to the 2006 LRDP. They can be described briefly as follows:

- **Computational Research and Theory (CRT) Building:** As currently projected, the CRT Building would likely be proposed as a six-story, 165,000-gross-square-foot building near the Blackberry Canyon Gate entrance to the Lab. It would provide high-end computing floor space and accompanying office space to support the Lab's National Energy Research Scientific Computing (NERSC) Center, which is currently operating within the confines of an off-site leased site in Oakland. It is currently anticipated that a tiered CEQA review for this facility would be conducted sometime around mid- to late 2007. (See Appendix D for further details.)
- **Helios Research Facility:** As currently projected, the Helios Research Facility building would likely be proposed as a four-story, 100,000-gross-square-foot laboratory building constructed south of existing LBNL Buildings 66 and 62 or in a location west of Buildings 72 and 67. The goal of the Helios project is to accelerate the development of renewable and sustainable sources of energy using sunlight by developing fundamentally new and optimized materials for use in collectors, efficient processing steps, and energy handling. It is currently anticipated that a tiered CEQA review for this facility would be conducted in 2008. (See Appendix D for further details.)

III.B.4.3 Leased Space

Since 2003, LBNL has terminated leases at two locations in the City of Berkeley and has added three leases in the cities of Berkeley, Walnut Creek, and Richmond for a net addition of approximately 44,000 square feet. This represents about 12 percent of the Lab's overall off-site leased space of approximately 340,000 square feet. Appendix C lists currently off-site leased facilities.

III.B.4.4 Traffic Conditions

To ensure that the previously counted turning movement volumes (conducted in 2002 – 2003) adequately represent current conditions, new traffic counts were undertaken at each of the study intersections in October 2006 (when UC Berkeley and City of Berkeley schools were in session). In general, the volumes counted in 2006 were lower than those counted previously, with 18 of 20 intersections having current volumes in both the a.m. and p.m. peak hours that were between 3 percent and 39 percent lower than those counted earlier. The average decline was 14 percent in the morning and 13 percent in the afternoon. Exceptions were at Centennial/Stadium Rim Way (a.m. peak hour, 5-percent increase, but overall volumes remain very low), and Dwight/Piedmont-Warring and College/Bancroft (p.m. peak hour, 9-percent and 4-percent increases, respectively, with little or no increase in the conflicting movements that determine level of service). At the Panoramic Way/Canyon Road/Stadium Rim Way intersection, a.m. peak-hour

volumes were essentially unchanged (although p.m. peak-hour volumes declined by 20 percent between the 2003 and 2006 counts). All intersections where volumes increased between the prior counts and the 2006 counts currently operate (and will operate in the future) at good levels of service (LOS B or C). The October 2006 counts were also compared to the volumes counted for the UC Berkeley Southeast Campus Integrated Projects (SCIP) EIR (taken in January 2006). Once again, the current counts are lower, except at Centennial/Stadium Rim Way (a.m. peak hour, increase of 33 percent but, as stated above, the overall volume was low and the level of service remained good) and Bancroft/Gayley-Piedmont (p.m. peak hour, increase of 5 percent, but there was a decrease in conflicting movements that determine level of service).

III.C. Institutional Approach, Principles, and Strategies

III.C.1 Project Objectives

The proposed 2006 LRDP outlines the following approach to revitalizing the facilities and infrastructure at the main site:

- Strengthen and expand existing research programs to sustain and grow Berkeley Lab's role as a national research institution;
- Expand partnerships and collaborations to enhance Berkeley Lab's scientific and technical base;
- Provide flexibility to return staff from its off-site facilities leased in Berkeley and Oakland to the main site in order to enhance collaboration, productivity, and efficiency;
- Expand the capacity of existing high-demand advanced facilities and provide broader functionality;
- Rehabilitate facilities that have outlived their intended purpose and can be cost-effectively adapted for use in new regions of scientific discovery;
- Replace single-purpose facilities with new facilities programmed to accommodate multiple disciplines with advanced infrastructure suitable for future scientific endeavors; and
- Construct new scientific facilities to support future research initiatives and continued growth in existing programs.

III.C.2 Principles and Strategies

The 2006 LRDP also includes a number of principles and strategies intended to guide future development at the Lab. A separate, companion document, the Berkeley Lab Design Guidelines, will provide direction for physical development under the 2006 LRDP. These proposed Design Guidelines are proposed to be adopted by the Lab following The Regents approval of the 2006 LRDP. These principles, strategies, and design guidelines are listed in Appendix B and are referred to in the Project Description and the various technical sections of this EIR, as appropriate.

III.D. Proposed Project

This EIR evaluates the proposed 2006 LRDP, including a project variant in which most off-site Lab employees would be relocated to the hill site. In addition, for purposes of describing specific physical impacts that could reasonably be expected to occur as a result of development anticipated pursuant to the 2006 LRDP, this EIR evaluates an Illustrative Development Scenario, which represents a reasonable outcome of 2006 LRDP implementation.

If approved, the proposed Draft 2006 LRDP would become Final and would replace the 1987 LRDP. The 2006 LRDP would provide guidance for continuing and projected development and activities at the main LBNL site, at space on the UC Berkeley campus, and at off-site leased locations, assuming a horizon year of 2025. Under the proposed 2006 LRDP, the total research and support space area at the main LBNL hill site would increase to as much as 2.42 million square feet. The 2006 LRDP does not assume an increase in space occupied on the UC Berkeley campus, but allows for reallocation of that space among different buildings; it also provides that off-site commercial leases would depend on specific Laboratory needs and market conditions. The ADP would also increase 22.8 percent from the baseline 4,375 to 5,375. This translates into an average annual growth rate of less than one-half of the overall 2.5-percent annual growth since adoption of the 1987 LRDP. Table III-1 presents baseline and future population and space projections.

**TABLE III-1
BASELINE AND FUTURE POPULATION AND SPACE PROJECTIONS (approx.)**

	Baseline (2003)	Future (2025)	Change (2025)
Adjusted Daily Population (ADP)			
LBNL Hill Site	3,650	4,650	+1,000
UC Berkeley Campus	350	350	0
Leased Space ¹	375	375	0
Total Lab Population	4,375	5,375	+1,000
Building Space (gsf)			
LBNL Hill Site	1,760,000	2,420,000	+660,000 ²
UCB Campus Space (nsf) ³	100,000	100,000	0
Leased Space ¹	338,000	338,000	0
Total Occupied Space	2,198,000	2,858,000	660,000

gsf – gross square feet; nsf – net square feet

- ¹ “Leased space” includes the Lab’s warehouse in west Berkeley, and leased office and research space in downtown and other areas of Berkeley, downtown Oakland, Walnut Creek, and various other locations. See text above.
- ² Change in building space is net value: 320,000 gsf of demolished space subtracted from overall space construction figure of 980,000 gsf occupiable space would result in 660,000 gsf of new occupiable space. Two projects—the Molecular Foundry and Building 49—have been approved under the 1987 LRDP and LRDP EIR. The Molecular Foundry has since been constructed, but Building 49 is indefinitely on hold. For purposes of analysis, the Molecular Foundry—approximately 95,000 gsf—is counted as part of the project to be developed and not as part of the baseline setting.
- ³ Space occupied by LBNL on the UC Berkeley campus is variable; the amount of space in the table is the maximum that LBNL uses.

As shown in Table III-1, it is anticipated that the increase in ADP and building space under the 2006 LRDP would take place on the Lab's main hill site. Off-site ADP and building space is expected to remain roughly the same as at present, although the specific locations and the precise amount of space occupied would likely vary somewhat over time.

The review of the proposed project in this EIR includes two projects that have been approved and constructed pursuant to the 1987 LRDP EIR, as amended: the Molecular Foundry (S-11) and the Animal Care Facility (S-15). This EIR also evaluates several projects that are either currently under consideration and undergoing CEQA review or anticipated to undergo CEQA review in the near future, or likely to be under consideration at some point in the future. These projects are the CRT Building (S-1), the Helios Research Facility (S-12), the Guest House (S-5), the User Support Building (S-6), and the Bevatron demolition project. More details regarding all of these projects are included in this chapter in Section III.B.4, "Changes in Baseline Conditions Since 2003" and in Appendix D.

As explained in Section III.A, above, the scope of potential development on the main hill site pursuant to the 2006 LRDP has been reduced since the issuance of the Notice of Preparation for this EIR. The NOP anticipated a possible maximum of 1,240,000 gsf of new research and support space construction, and 440,000 gsf of demolition, leading to up to 800,000 net new gsf of occupiable space. Since the release of the NOP, however, it has become apparent to Lab staff that DOE funding priorities may limit the scope of development pursuant to the 2006 LRDP, and while it is possible that other funding sources may make up some of this difference, this reallocation of DOE priority is likely to decrease the amount of development on the main hill site. In addition, and more importantly, substantial concerns were raised by the City of Berkeley in a series of meetings regarding the amount of growth proposed on the main hill site. For both of these reasons, the Lab determined that the 2006 LRDP and the proposed project presented in this EIR should be reduced in scope to 980,000 gsf of new occupiable building space construction, with 320,000 gsf of demolition for a net total of 660,000 gsf of new occupiable space. This is a reduction of approximately 21 percent in the amount of possible new construction of occupiable space under the 2006 LRDP, and a reduction of 17.5 percent in the amount of possible net new occupiable space.

III.D.1 Project Variant

The project variant is analyzed in the event that Berkeley Lab management decides during the course of the planning period to consolidate most of its personnel on the main hill site. Under this scenario, up to approximately 350 employees currently working off-site would be transferred to the main hill site and approximately 25 LBNL staff would continue to work off of the Lab's main hill site or the UC Berkeley campus. These remaining off-site personnel would likely include warehouse staff and personnel based in Walnut Creek, California, and Washington, D.C., for a total of approximately 25 people (see Table III-2). Under the variant, space projections on the main hill site would not be expected to change, although some administrative office space may be used more intensively. In addition, the number of parking spaces provided to Laboratory employees would not be increased to accommodate this additional hill staff.

**TABLE III-2
PROJECT VARIANT: HILL SITE CONSOLIDATION
BASELINE AND FUTURE POPULATION AND SPACE PROJECTIONS (approx.)**

	Baseline (2003)	Future (2025)	Change (2025)
Adjusted Daily Population (ADP)			
LBNL Hill Site	3,650	5,000	+1,350
UCB Campus Space	350	350	0
Leased Space ¹	375	25	-350
Total Lab Population	4,375	5,375	+1,000
Building Space (gsf)			
LBNL Hill Site	1,760,000	2,420,000	+660,000 ²
UCB Campus Space (nsf) ³	100,000	100,000	0
Leased Space ¹	338,000	126,000	-212,000
Total Occupied Space	2,198,000	2,646,000	+448,000

gsf – gross square feet; nsf – net square feet

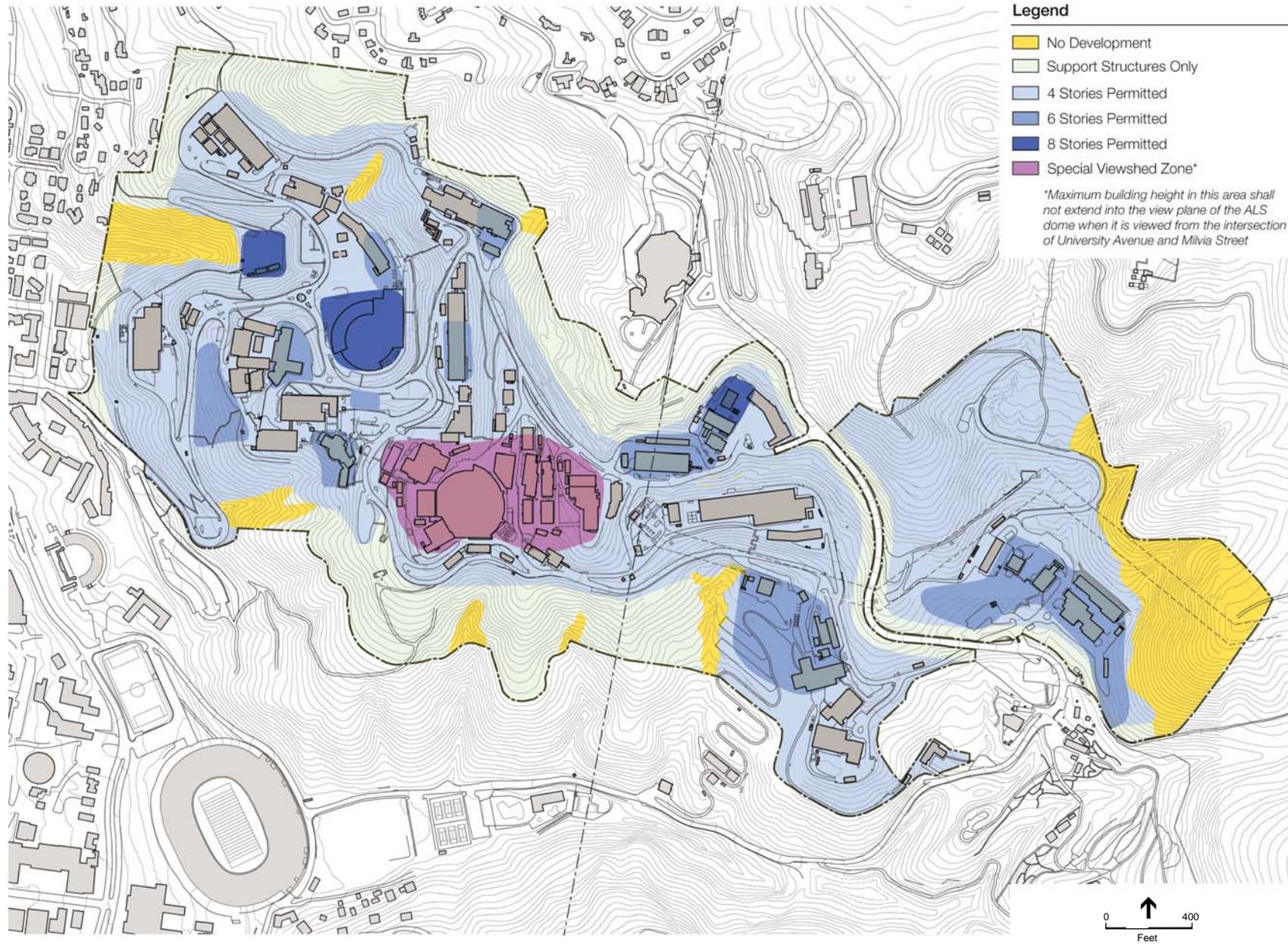
- ¹ “Leased space” includes the Lab’s warehouse and leased space in downtown Berkeley, downtown Oakland, Walnut Creek, and various other locations. See text above.
- ² Change in building space is net value: 320,000 gsf of demolished space subtracted from overall space construction figure of 980,000 gsf occupiable space would result in 660,000 gsf of new occupiable space. Two projects—the Molecular Foundry and Building 49—have been approved under the 1987 LRDP and LRDP EIR. The Molecular Foundry has since been constructed, but Building 49 is indefinitely on hold. For purposes of analysis, the Molecular Foundry—approximately 95,000 gsf—is counted as part of the project to be developed and not as part of the baseline setting.
- ³ Space occupied by LBNL on the UC Berkeley campus is variable; the amount of space in the table is the maximum that LBNL uses.

III.D.2 Height Zones

Due to the combination of geomorphic features, screening trees and terrain, built and natural elements, and availability to off-site viewpoints, the Lab’s 202-acre hill site hosts a variety of opportunities and constraints for building heights. Chief among these opportunities and constraints are aesthetic considerations involving how different building heights and scales might affect the visual character of the Lab as viewed from important off-site locations. Accordingly, and to support the aesthetic principles put forth in the LBNL Design Guidelines, Figure III-6 depicts a Height Zoning Map that would guide placement and height of buildings under the 2006 LRDP. The proposed Design Guidelines are a companion document to the 2006 LRDP and will provide direction for physical development pursuant to the LRDP. The Design Guidelines are set forth in Appendix B to this EIR, and are proposed to be adopted by the Lab following The Regents approval of the 2006 LRDP.

III.D.3 Land Use Plan

The 2006 LRDP Land Use Plan (see Figure III-3, p. III-7) would establish four land use zones for the Lab’s hill site. It has been configured in accordance with five key objectives that derive from site conditions, the Lab’s scientific mission, the heritage and success of team science, and the continuing desire for intense collaboration among various users. In conjunction with the LBNL Design Guidelines and land use objectives and with avoidance of fixed land use constraints (such as important habitat or seismic zones), the Land Use Plan would guide siting decisions for future buildings and support facilities.



SOURCE: LBNL, 2006

LBNL 2006 Long Range Development Plan . 201074

Figure III-6
Building Height Map

III.D.3.1 Land Use Zones

The 2006 LRDP provides a new framework for development of the main LBNL site by identifying four zones of development intensity. These land use zones are (1) Research and Academic, (2) Central Commons, (3) Support Services, and (4) Perimeter Open Space. These land use zones replace the seven functional zones identified in the 1987 LRDP.

It is not possible to anticipate all specific facilities requirements or future funding availability for the research programs that would be developed to address emerging scientific missions. Therefore, specific facility siting and design decisions are not made in the LRDP. Rather, the Land Use Plan identifies the above four land use zones that would guide development, and includes policy language to direct the form of new buildings. It also describes the land uses that are allowed in each zone.

Research and Academic

The vast majority of developable sites at the Lab are planned for research and academic uses. Within these areas all typical Lab research facilities as well as supporting uses such as parking, circulation and administrative uses would be located. Research space would include laboratories, offices, and specially outfitted areas such as accelerator facilities. Research space would also include associated support activity areas such as cold rooms, clean rooms, glass wash, microscopy, and instrument rooms. Non-research uses would be permitted, but not promoted; instead, such uses would be encouraged to locate in the Central Commons or Support Services zones (see below). Under the LRDP, priority would be given to siting new facilities where service infrastructure and roads are in place. The Research and Academic zone would include approximately 121 acres, largely encompassing or adjacent to already developed portions of the main hill site.

Central Commons

As a subset of the Research and Academic zone, the Central Commons would be the main location of dining and gathering uses, as well as visitor accommodations. This approximately six-acre “heart” of the Lab would be the hill site’s primary gathering and event area. While academic and research functions would be permitted, this zone would be primarily reserved for common, shared uses. By concentrating gathering, event, and dining uses in this area, the Lab would seek to achieve a greater sense of “campus” and of interaction among researchers, academics, visitors, students and staff, thus supporting the “team science” concept that is at the heart of the Lab’s culture.

Support Services

The Support Services zone would provide a central location for the Lab’s support functions, such as shops, environmental services, corporation yards, and maintenance. Facilities maintenance and other operations and logistical spaces would provide for operating, maintaining, and repairing the Lab’s buildings and grounds. Such spaces would include wood, metal, machine, and paint shops; materials delivery and storage areas; construction staging and laydown areas; vehicle and equipment depots; utility equipment and buildings; waste handling facilities; and cleaning

facilities. While academic and research functions would be permitted in this zone, it generally would be reserved for non-research uses so that efficiencies can be achieved in the organization and management of critical Lab support services.

Perimeter Open Space

The Perimeter Open Space land use zone would encompass the remaining areas of the Lab’s hill site and indicate areas of the Lab where future development would be primarily reserved for minor maintenance or support structures or paths and where the open, wooded, or grassland character of the hillside site would be retained to the extent feasible. Much of the Perimeter Open Space zone would comprise parts of the site where development potential is restricted due to constraints such as habitat quality and vegetation, seismic risk, utility easements, adjacent uses, and similar limitations. Throughout these areas various maintenance activities would continue to preserve and enhance appropriate vegetation characteristics.

Table III-3 summarizes proposed land uses at the main site by total area and percentage.

**TABLE III-3
PROPOSED LAND USE PLAN AREA CALCULATIONS**

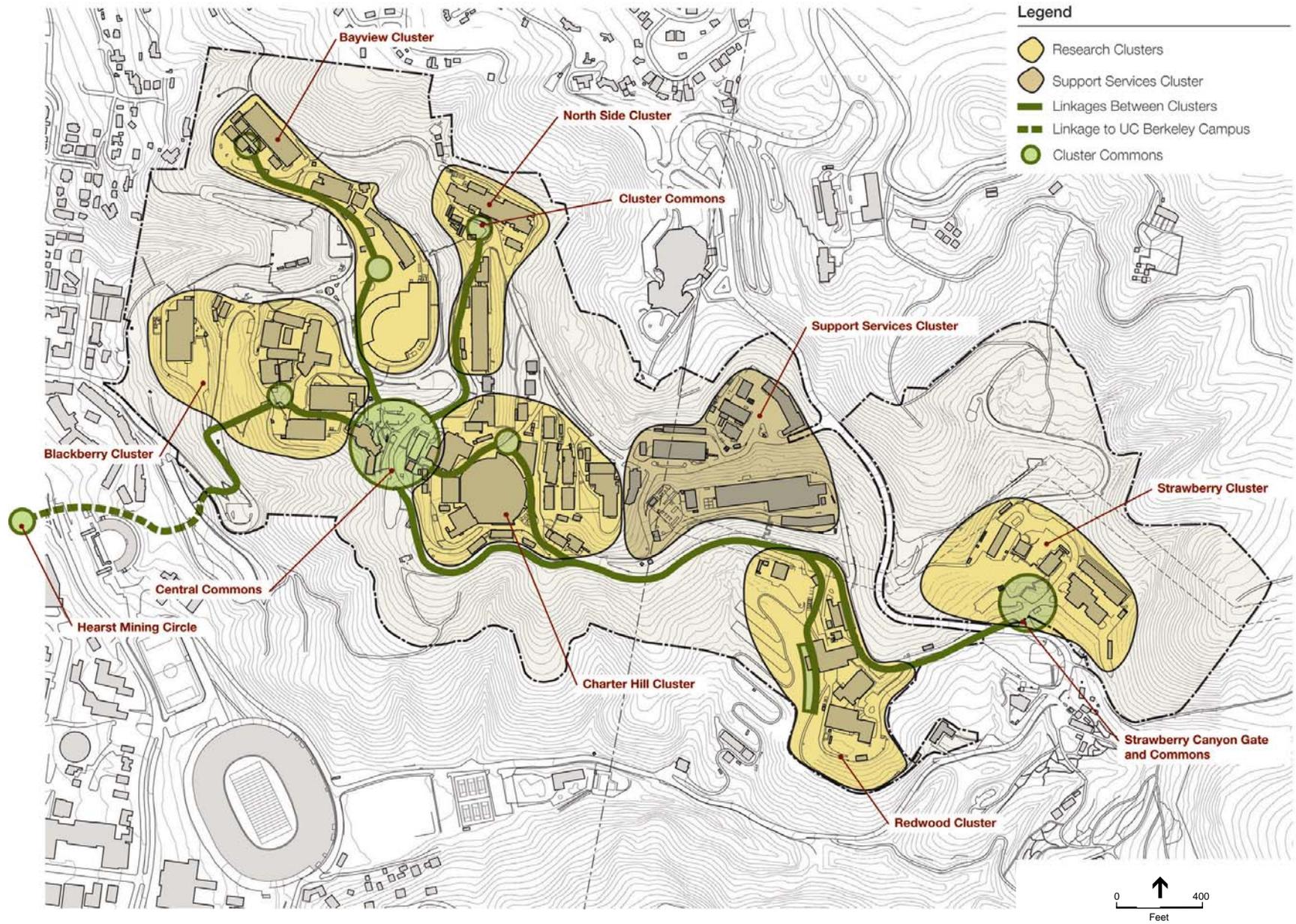
Land Use Zone	Area Acres	Percentage	
		Of Developable	Of Total
Research and Academic	121	83%	60%
Central Commons	6	4%	3%
Support Services	<u>19</u>	<u>13%</u>	<u>9%</u>
Total Developable Area	146	100%	72%
Perimeter Open Space	<u>56</u>		<u>28%</u>
Total Berkeley Lab Area	202		100%

SOURCE: LBNL

III.D.3.2 Development Clusters

The LRDP calls for developing clusters of research and academic uses close to one another and creating usable, attractive plazas and other open spaces that would function as “commons” for nearby buildings. This clustering of development would allow the Lab to evolve into a more campus-like setting, fostering interaction and informal encounters among Lab staff and supporting the “team science” heritage of the Lab.

As shown on Figure III-7, the LRDP’s Development Framework identifies six research clusters and one support services cluster focused around existing facilities. Each cluster corresponds to a collection of related facilities. Within each research cluster, a major outdoor use area would be encouraged, probably most often through the relocation of existing surface parking or temporary buildings. The specific configuration and design of new development within the research and academic zone would be guided by the LBNL Design Guidelines.



III.D.4 Transportation, Circulation, and Parking

Table III-4 lists proposed roadway improvements. See Figure III-9, the Illustrative Development Scenario, p. III-37, and 2006 LRDP Figure 3.20, Vehicle Circulation and Parking Framework, and related description for further discussion of proposed circulation and parking development under the proposed project.

**TABLE III-4
PROPOSED ROAD IMPROVEMENTS**

Road No.	Location	Length	Notes
R-1	Life Sciences Exit	800 feet	New limited access entry egress. Includes retaining wall.
R-2	Poultry Husbandry Area	1,800 feet	New limited access entry egress. Includes retaining wall.
R-3	Firehouse turn	600 feet	Minimizes traffic through work zone; improves traffic safety and overall transportation efficiency. Vertical grade and turning radius improvements. Includes retaining wall.
R-4	ALS area	800 feet	Minimizes traffic through work zone. Alignment change. Includes retaining wall.
R-5	Building 71	900 feet	Minimizes traffic through work zone. Includes retaining wall.
R-6	ALS area	300 feet	Eliminates one-lane/two-way road section. Includes retaining wall.
R-7	B58 area	300 feet	Eliminates one-lane/two-way road section. Includes retaining wall.
R-8	Blackberry Canyon Gate	300 feet	Truck lane for safety and security purposes. Includes retaining wall.

III.D.4.1 Vehicular Circulation

Several circulation improvements are planned to improve vehicular access while minimizing potential pedestrian-vehicular conflicts. Among these are a new service access gate planned off Centennial Drive near Building 73 to provide direct access to the Redwood Cluster area and an additional emergency point of egress. From this new gate, a road upgrade (R-2) is planned that would allow emergency access directly to the Redwood Cluster area. This improved road would connect to Lawrence Road near Building 31 and would provide an important emergency access and egress point from this part of the Lab.

Improvements to the existing Blackberry Canyon Gate (R-8) and Strawberry Gate (R-4) would provide for longer queuing lanes, new guard houses, and improved signage and landscaping. The existing Centennial Drive service access gate at “PG&E Point” would be improved in conjunction with the development of a new service road. (This gate would continue as a service-only access point.) From the improved access gate off Centennial Drive near “PG&E Point,” a new service access road (R-1) would connect to Calvin Road and provide access to the new buildings planned for this area, as well as egress from the new parking lot planned near the gate.

Improvements are planned for the major Lab circulation routes to allow two-way traffic on Chamberlain Road and other service roads (R-7). These improvements include widening in certain areas and the removal of roadside parking. In addition, Chamberlain Road is planned to be rerouted behind Building 71 (R-5) to allow a new building site at the M1 parking lot.

A new north-south roadway is proposed east of the Advanced Light Source (Building 6) (R-6) to more efficiently connect the Lab's two primary east-west roadways. Improvements to the intersection of Glaser and Lawrence Roads (R-3) are proposed to similarly enhance north-south circulation and improve safety.

III.D.4.2 Bicycle Circulation

Bicycle access would continue to be provided on the major and minor roads. Where feasible, bicycle lanes would be provided; in most cases bicycles would share the roadway with cars and trucks, as the moderate speeds dictated by the hill site are suitable to bicycle and vehicle use of the roads.

III.D.4.3 Parking

The proposed project includes development of 1,300 new parking spaces and the removal of 800 existing parking spaces such that parking on the hill site would increase by approximately net new 500 spaces, for a total of 2,800 parking spaces. Table III-5 shows the anticipated net change in parking spaces on the hill site. As is evident from Table III-5, the ratio of adjusted daily population to parking spaces would not increase over the life of the plan. Parking, as guided by the Lab's proposed new Transportation Demand Management (TDM) Program, would comply with UC Policy Guidelines for Traffic (see Mitigation Measure TRANS-1c in Section IV.L, Transportation/Traffic).

**TABLE III-5
2006 LRDP PROPOSED PARKING PROGRAM**

2003 Baseline Parking Spaces:	2,300
2003 Baseline Adjusted Daily Population (ADP)	4,375
2003 Baseline ADP to Parking Ratio	1.9
Anticipated Additional Spaces:	<u>500</u>
Total Planned Spaces:	2,800
Future Adjusted Daily Population (ADP)	5,375
Future ADP to Parking Ratio	1.9
2003 Baseline Parking Spaces:	2,300
Spaces to be removed:	(800)
New spaces to be added in lots:	450
New spaces added in structures:	<u>850</u>
Total spaces per plan:	2,800

As described in Section III.A, above, the scope of the proposed 2006 LRDP and the amount of potential development under that LRDP have been reduced since the issuance of the NOP for this EIR. While the NOP anticipated a possible maximum of 600 net new parking spaces, the Lab has determined that the LRDP and the proposed project should be reduced in scope to include 500 net new parking spaces. This reduced scope is due in part to the possibility that DOE funding priorities may limit the scope of development pursuant to the LRDP. More importantly, it is due to concerns raised by the City of Berkeley in a series of meetings regarding the amount of growth proposed under the LRDP. For these reasons, the Lab determined that the proposed project presented in this EIR should include 500 net new parking spaces, rather than 600 net new parking spaces, for a total of 2,800 spaces.

This EIR analyzes two new parking structures with a total of 850 parking spaces proposed to be located near the Lab gates and several mid-sized parking lots would be created, primarily on sites of buildings to be demolished. These lots and structures would consolidate parking spaces removed from roadsides, service areas, the interiors of research clusters, and building sites. Consolidating the parking closer to the gates would be expected to reduce auto circulation within the Lab, creating a more pedestrian-friendly environment, and would also reduce the parking-related impervious surface area at the Lab by concentrating parking in multi-story structures that occupy less ground area per parking space than do surface lots. Preferred sites for two major parking structures and a series of mid-sized parking lots are depicted on Figure III-9, the Illustrative Development Scenario map, p. III-37.

Bicycle parking would be located at building entries and/or at the edges of outdoor open spaces centered in building clusters.

III.D.4.4 Pedestrian Circulation

The 2006 LRDP includes a Pedestrian Circulation Plan that illustrates planned improvements to the pedestrian network at the Lab. The plan also identifies the relationship of the pedestrian network to the shuttle system and to the commons areas. Pedestrian paths would be improved or added in key areas of the hill site, in particular where they would reinforce important connections between and within the research clusters.

III.D.5 Open Space Plan

As depicted on the proposed Land Use Plan, Figure III-3, p. III-7, under the 2006 LRDP, a substantial portion of the Lab main hill site would be designated as Perimeter Open Space. This land use zone would encompass areas set aside due to constraints that require that minimal intrusion or activity occur, and other areas that are intended to remain primarily as open space because they enhance the visual image of the Lab from within and outside the site.

The Lab site also contains large stands of mature trees, grassy slopes, and other vegetation that comprise major additional open space, which occurs within all LRDP land use zones, particularly in the Research and Academic land use zone. These additional vegetated areas are important elements of the character of the Lab site.

III.D.5.1 Perimeter Open Space

Perimeter Open Space would consist of 56 acres, or 28 percent of the 202 acres on the main hill site. These areas around the periphery of the Lab are proposed to be maintained primarily as they currently exist, due to their important biological, aesthetic, or other characteristics.

III.D.5.2 Developed Open Areas

Within the zones where research facilities are currently located, and where future research facilities would be focused, there is a wide variety of open space conditions. Due to the hilly nature of the Lab site, spaces between development clusters, and even between buildings, may function as open space. These spaces are usually rustic in character with trees and a variety of grasses or shrubs. These areas would be maintained in their natural states. In a limited number of cases it may be necessary to re-grade or reshape these areas to facilitate the siting of a future research facility. In such cases, efforts would be made to retain and/or replace trees and other elements that contribute to the open space character of the Lab site.

III.D.5.3 Cluster Open Area

Under the 2006 LRDP, future development at Berkeley Lab would build upon and strengthen the existing hillside cluster development pattern to create a more campus-like setting that reflects its unique site and functional needs. The main hill site would be organized into six “research clusters” defined by major topographic features encompassing research functions that share common needs and interests. One “service cluster” would provide a central location for facilities and shipping/receiving operations. A network of pedestrian paths would link these clusters to the “Central Commons” area that would serve as the social heart of the Laboratory.

Most new buildings would be located on infill sites and/or adjacent to existing facilities, resulting in a higher density of development within each cluster and retention of more undeveloped space between clusters. Outdoor spaces for pedestrian uses would be located toward the center of the clusters, in spaces formally defined by the edges of new and existing buildings. The specific configuration and design of new development within the clusters would be guided by illustrative plans and by the LBNL Design Guidelines that, while separate from the LRDP, would support the Lab’s objectives and address specific design of outdoor spaces and buildings.

At present, the areas most central to the research clusters are typically parking lots, are occupied by temporary facilities (many of which have been in place for many years), or consist of roads or service areas. As proposed under the 2006 LRDP, a large percentage of existing parking and service areas would be relocated, to the extent feasible. This would allow for reconfiguration of the research clusters to function more efficiently and to be connected to one another by pedestrian paths. In addition, improvements to roads would be made to accommodate transit stops, bicycle parking, pedestrian sidewalks, and other amenities to support the Lab’s transportation demand management efforts.

III.D.5.4 Cluster Common Open Area

The intent of the 2006 LRDP is to create a usable outdoor space, such as a plaza, within each cluster. These outdoor spaces would be scaled to be appropriate for the cluster of facilities, with amenities to encourage informal use.

III.D.6 Landscape and Vegetation Management

III.D.6.1 Landscape Framework

While additional research facilities would be added to the Lab in coming years, the hill site is anticipated to retain a strong sense of open space and landscape. The 2006 LRDP includes plans to reinforce this natural appearance, both from outside views as well as from views within the site. The Land Use Plan identifies areas of the campus that would remain undeveloped, and the proposed Landscape Framework further defines the ways in which these various open spaces would be planted and otherwise improved. The 2006 LRDP Landscape Framework identifies five key categories of landscape, each of which would be landscaped or maintained differently. They are depicted in Figure III-8.

Rustic

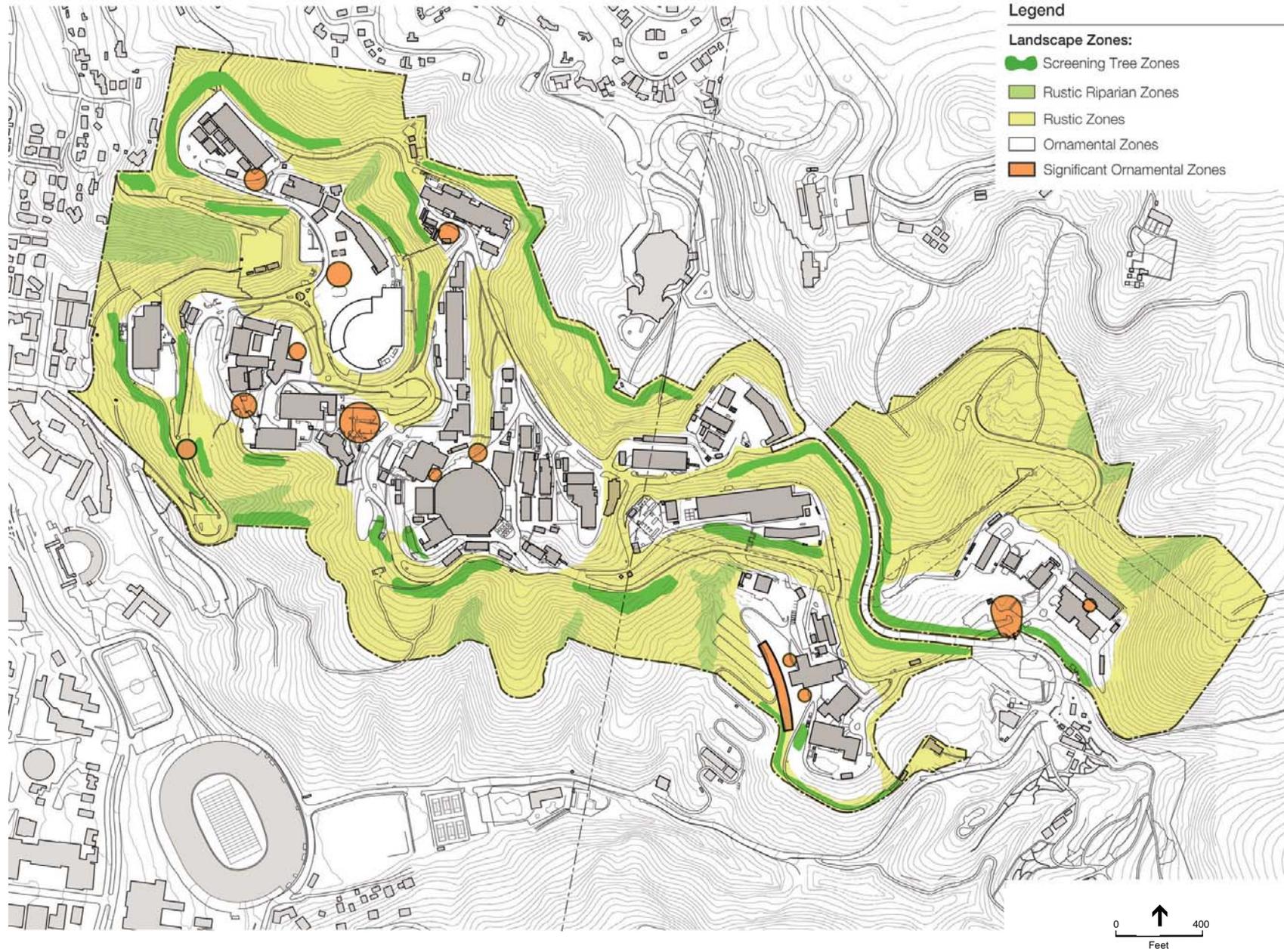
The vast majority of the Lab site is characterized by the rustic, diverse landscape mosaic of oak and mixed hardwood forests, native and non-native grasslands, chaparral, coastal scrub, marsh and wetland communities, and riparian scrubs and forests that would be retained in their naturalistic state. Maintenance activities would be undertaken to maintain the health of these areas. Pedestrian paths would be carefully aligned through these areas, but in general most Lab activities would not occur in these rustic zones.

Rustic Riparian

Several riparian environments that occur on the hill site have significant habitat value. These environments would be protected from development, with only maintenance activities permitted.

Screening

These existing or proposed tree stands would screen views of Lab buildings. Important stands of trees that currently screen Lab buildings from view from the surrounding community would be maintained, and additional screening would be added where it can help maintain the distinctive character of the site. Screening trees would also be added within the main site along Centennial Drive, which passes alongside and, on one overpass, over a portion of the Lab (though fencing restricts Lab access to Centennial Drive users). Screening this area would provide a visual buffer for those passing the Lab site on Centennial Drive on the way to areas higher up in the hills, such as the Lawrence Hall of Science or the University's Space Sciences area.



Ornamental

The developed areas of the Lab correspond to the research clusters, support areas and parking lots and are currently landscaped with a variety of plant materials. Within the developed portions of the site, where high levels of pedestrian activity occur, ornamental landscapes would be used to add color, visual interest, and other amenities. This strategy would be continued as aging or outdated facilities are removed and new ones are added.

Significant Ornamental

As the common areas within the clusters of research uses are reconfigured to provide more usable outdoor areas, landscaping would be used to reinforce their attractiveness through the use of color, texture, and visual interest. In particular the Central Commons, the primary gathering space of the Lab, would be landscaped and furnished to provide a diversity of usable outdoor environments for special events. At the highest activity pedestrian areas – the Central Commons and secondary commons spaces – special plantings can be used to heighten visual interest.

III.D.6.2 Vegetation Management

As described in the 2006 LRDP, the Laboratory is a campus-like setting maintained in a manner similar to a research park. Continuous improvements in landscaping for both developed and undeveloped areas of the Lab are anticipated under the 2006 LRDP. This landscape management approach is consistent with the Laboratory's fire-safe vegetation management measures that annually remove tree limbs a minimum of six to eight feet from the ground, mow or allow grazing of grasses, remove brush from most vegetated areas of the site, and plant ornamental species near buildings for fire safety. The LRDP landscape management approach is also consistent with urban forestry practices that ensure long-term health of trees and tree stands. Berkeley Lab's existing vegetation management would continue under the 2006 LRDP. Three biologically sensitive areas of the Laboratory have been identified as low fire risk. (Two feature riparian vegetation surrounding perennial or perennial/intermittent drainages, and one is an area of Alameda whipsnake habitat.) These three areas are not managed on an annual basis. However, to preserve the long-term health of trees in these three areas, brush and grasses on the perimeter of these areas are managed under the above annual prescription standards to reduce the risk of ignition of these trees and allow these trees to continue to serve as part of the urban forest. The Lab's vegetation management program would continue to encourage native plants and removal of invasive exotic plants, including French broom, artichoke thistle, Cape ivy, and pampas grass. Eucalyptus and other non-native tree stands across the site would continue to be removed or thinned.

III.D.7 Infrastructure and Utilities

The 2006 LRDP foresees improvements to Berkeley Lab's infrastructure to increase reliability, flexibility, and efficiency, and to increase redundancy in the provision of critical services and utilities. Included among the LRDP's Development Principles is an intention to locate upgraded and new service lines in corridors.

III.D.7.1 Green Building Design, Clean Energy Standards, and Sustainable Transportation Policy

The 2006 LRDP is consistent with the University's Presidential Policy for Green Building Design and Clean Energy Standards, adopted in July 2003 (amended October 24, 2003), which seeks to minimize the University's impact on the environment and to reduce the University's dependence on non-renewable energy. The policy is based on the Leadership in Energy and Environmental Design (LEED) rating system promulgated by the U.S. Green Building Council. Berkeley Lab will design and build all new buildings to meet the LEED "certified" rating, at a minimum, and will strive to meet the higher "silver" rating with additional sustainability features proven to be lifecycle cost-effective. In addition, all new buildings will outperform the required provisions of the California Energy Code by at least 20 percent and the Lab will strive to achieve the goal of procuring at least 20 percent of its electricity needs from renewable resources by 2017. The 2006 LRDP states that Berkeley Lab will develop a sustainability strategy integrating the Lab's site, climate, and infrastructure-intensive facilities to achieve the most sustainable facility practicable.

III.D.7.2 Utility Infrastructure Upgrades

Under the 2006 LRDP, the Lab would continue to upgrade and add utility infrastructure to support building development. These upgrades include projects to improve water, natural gas, electrical, sanitary sewer, storm sewer, and compressed air utility infrastructure. Existing water distribution lines would be replaced over the duration of this LRDP to ensure continued reliability and reduce water demand due to "line-loss" attributed to outdated, deteriorating pipelines. Upgrades to the water system would include replacement of outdated water mains, installation of a new 12-inch EBMUD connection at the Laboratory's northeast boundary to augment the existing two service lines, and replacement of an existing 8-inch line located under Centennial Drive.

During the past approximately 20 years, LBNL has replaced, re-lined, or re-routed approximately half of its sanitary sewer pipes. Under the 2006 LRDP, the Lab would also continue replacing aging sanitary sewer infrastructure to reduce stormwater infiltration during wet weather conditions. Sewer mains on-site would be replaced with new pipe located within the utility corridors where possible. The Strawberry Monitoring Station would be upgraded and the Centennial Drive sewer main from the Life Sciences area would be replaced. Additionally, LBNL would continue working with UC Berkeley and the City of Berkeley to identify a feasible solution to accommodate increased effluent on the Strawberry Outfall due to project-related growth. LBNL has completed a study reviewing four options to divert LBNL-related sanitary sewer flows around problematic sewer lines in Berkeley. Additionally, some two-thirds of the steel pipe that comprises the Laboratory's stormwater drainage system is anticipated to be replaced or fitted with nonmetallic lining.

Implementation of the 2006 LRDP would also require specific connections to the existing electrical and natural gas distribution system. New building and existing equipment replacement projects would enhance the Laboratory's ongoing energy conservation efforts. In addition, new emergency or back-up electrical generators would be installed at several locations, with capacities

of up to 750 kilowatts. Finally, improvements are anticipated to be required to the Lab's various specialized utility systems, including compressed air, low-conductivity water, closed-loop cooling water, purified water, and de-ionized water system, as demand for these utilities is expected to increase proportionately with the increase in laboratory space at LBNL under the 2006 LRDP program.

Utility and pipe replacement at LBNL typically includes excavation and trenching, shoring of trenches as necessary, cutting and replacement, and covering and restoring surface areas. Pipe bursting and/or less intrusive pipe lining methods are also used when feasible.

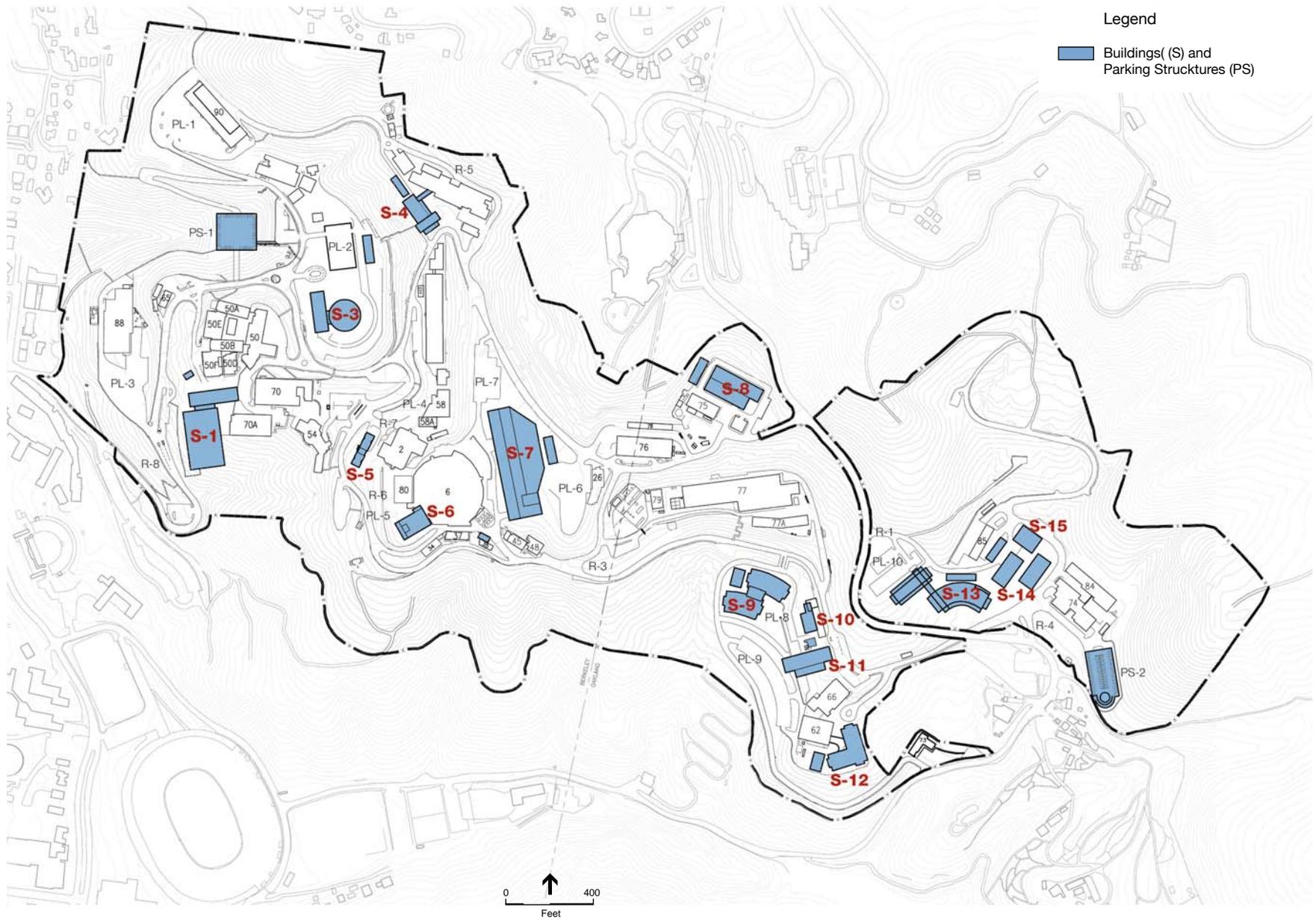
III.E. Conceptual Portrayal of Potential Development: Illustrative Development Scenario

To provide greater detail and more complete public disclosure of potential project impacts, and also to provide a basis for some of the quantified modeling that has been completed for this LRDP, the Lab has developed an Illustrative Development Scenario which is presented in **Figure III-9**.

This Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP that would be consistent with the 2006 LRDP goals and objectives, the 2006 LRDP Land Use Map, the LBNL Design Guidelines, and the LRDP's proposed development uses and square footages. The Illustrative Development Scenario is intended to provide a conservative basis for the analysis of environmental impacts. Actual overall development that is approved and constructed pursuant to the LRDP would be less intense than portrayed in the scenario. The scenario was developed before the proposed 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. At any particular site, however, the level of development may approach the intensity that is portrayed in the scenario, so the scenario remains an appropriate and conservative basis for evaluating the potential environmental impacts of the proposed 2006 LRDP.

Also, the actual locations of buildings, configurations, uses, and the like may vary as specific projects are considered for approval in the future. The Laboratory's needs and opportunities will change over time, at any particular site, and the Illustrative Development Scenario is not intended to be a precise representation of the actual development program that would take place over the 20-year planning horizon of the 2006 LRDP.¹⁹

¹⁹ It is not possible to forecast accurately the complex series of development opportunities and decisions, including future building locations, sizes, configurations, uses, construction schedules, etc., that would comprise full development of the LRDP program.



SOURCE: LBNL, 2006

LBNL 2006 Long Range Development Plan . 201074

Figure III-9
Illustrative Development Scenario

The EIR uses the Illustrative Development Scenario in the following ways:

- 1) To illustrate potential development pursuant to the 2006 LRDP based upon a conceptual portrayal of such potential development, and therefore give the reviewer an illustrative sense of the scope and scale of potential development at any particular site pursuant to the LRDP.
- 2) To provide a basis for the EIR's analysis of project impacts consistent with the CEQA Guidelines provisions for program EIRs and consideration and evaluation of future actions after the program EIR has been certified; and
- 3) To provide a basis for such quantified or modeled studies as the Human health risk assessment and visual simulations.

The Illustrative Development Scenario shows approximate siting and dimensions of new buildings, parking garages, and roadway changes, and demolition of existing buildings. Further detail and discussion of these project elements follow in this chapter. Consistent with the 2006 LRDP Land Use Plan, the Illustrative Development Scenario indicates that development of major new buildings would take place within the Research and Academic, Central Commons, and Support Services zones of the Lab. Parking structures and a number of parking lots would be spread relatively evenly throughout the Lab. Two redevelopment areas are identified, in the Old Town and Bevatron areas. The Illustrative Development Scenario also includes the already constructed Molecular Foundry building.

While actual development at LBNL under the term of the 2006 LRDP would likely not be precisely what is presented in this Illustrative Development Scenario, LBNL would consider how each individual project conforms to the assumptions and impact analyses presented in the 2006 LRDP EIR to determine what, if any, further CEQA documentation is necessary at that time. If specific project differences from the presentation of the Illustrative Development Scenario and the 2006 LRDP EIR are such that the project is not within the scope of the LRDP EIR or the specific impact statements and mitigation measures do not cover the individual project pursuant to CEQA Guidelines Sections 15168(c)(2) and 15168(c)(5), then appropriate, project-specific CEQA analysis will be tiered from this 2006 LRDP EIR in accordance with CEQA Guidelines Sections 15168(d)(1-3). This use of the Illustrative Development Scenario in connection with further approvals is subject to the overall limitations on subsequent review that have been stated elsewhere in this EIR. In particular, any development in excess of a net total of 980,000 gross square feet of new occupiable (research and support) space construction or 320,000 gross square feet of demolition would require an amendment of the LRDP and accompanying CEQA review. Absent such an amendment and the accompanying additional CEQA review, this EIR (including the Illustrative Development Scenario) will not be used as a first-tier EIR for, or to reduce or streamline the subsequent CEQA processing of, any project that, when added to other construction pursuant to this LRDP, exceeds a net total of 980,000 gross square feet of new research and support space construction or 320,000 gross square feet of demolition.

It is important to understand the difference between the provisions of the proposed 2006 LRDP and the descriptions contained in the Illustrative Development Scenario. If adopted, the provisions of the 2006 LRDP will become binding planning guidelines and policies for the Laboratory, and later

projects carried out by the Laboratory must be consistent with the 2006 LRDP (unless the LRDP is amended). In contrast, the descriptions contained in the Illustrative Development Scenario are not binding or governing policies, but the Illustrative Development Scenario will be part of the information that is considered in determining the appropriate form of CEQA review for later approvals of specific projects pursuant to the 2006 LRDP. Thus the scenario is illustrative, and is provided in this EIR for the purpose of evaluating the impacts of development that may occur pursuant to the proposed LRDP. Under the CEQA Guidelines, for later approvals based on a program EIR, the Illustrative Development Scenario may be considered (along with other information, and along with the overall limitations on subsequent review that have been stated elsewhere in this EIR) in determining whether the proposed later approval is within the scope of this EIR's analysis, or whether some level of further analysis is required under CEQA.

III.E.1 Building Construction and Replacement

The 2006 LRDP uses the topography of the overall Laboratory site to define the boundaries of a series of identifiable research clusters, then presents both landscape and building design policies to be applied in order that discernible campus settings are created within each research cluster during the term of this LRDP (see LRDP Section 3, Development Framework).

The research cluster concept would be implemented using the existing development fabric and through a combination of new construction, building renovation, infrastructure improvements, and demolition of outdated buildings. The 2006 LRDP calls for construction of new buildings at a generally greater density and with greater efficiency in design and layout than is the case with many existing LBNL structures, thereby resulting in retention of more undeveloped space between clusters. New and replacement buildings would be constructed using sustainable design practices, including those that minimize energy and water consumption, to meet or exceed the UC Presidential Policy for Green Building Design.

As described previously, occupiable building space on the hill site could increase by up to 660,000 gsf (including the now-constructed 95,000-gross-square-foot Molecular Foundry and the 7,100-gross-square-foot Animal Care Facility). New buildings would provide office, laboratory, and support space for research to accommodate projected growth in ADP and to relieve existing space shortages. New construction would also accommodate special-use spaces, large-scale scientific facilities such as a new accelerator-based light source for ultrafast science (a next-generation Light Source), new microscopes and facilities for the National Center for Electron Microscopy, a new facility to house future generations of supercomputers for the National Energy Research Scientific Computing Center, new specialized nanoscience and biological research facilities for sustainable energy development, and other specialized instrumentation and laboratories for basic research.

The Laboratory would continue to support a development framework that places buildings among trees and generally provides considerable screening of buildings from viewpoints in the city below. There are three building locations that would be more visible from these viewpoints and that have been identified for possible development. These building locations are analyzed as part of the Illustrative Development Scenario and consist of (1) the knoll west of Buildings 70 and

70A and south of the Building 50 complex that is identified in the Illustrative Development Scenario for placement of a high-performance computing facility; (2) the Building 71 knoll (since Building 71 is one of the more visible buildings from below, and further development in this area would also be more visible as tall trees are not generally suitable for the rocky southwest exposure of the slope immediately to the west of this site); and (3) the Building 62 knoll (since Building 62 is one of the more visible buildings from below, and further development in this area would also be more visible as tall trees are not generally suitable for the rocky southwest exposure of the slope immediately to the south and west of this site). Consistent with the LBNL Design Guidelines, the design of buildings to be proposed for any of these sites would incorporate elements that reduce overall visual effects at these locations, such as partial insertion of buildings into hillsides and design of building footprints in parallel with natural terrain.

Berkeley Lab would continue to ensure that all new buildings, structures, program equipment, and heavy shielding are designed to resist a magnitude 7+ earthquake on the Hayward Fault without collapse or a magnitude 8.3 earthquake on the San Andreas Fault without collapse.

III.E.2 Potential New Buildings

Under the term of the 2006 LRDP, a number of new buildings, along with support, utility, and parking structures, may be constructed. For reasons previously discussed, including uncertainty in future funding processes and scientific initiatives, it is not possible to project with confidence which specific buildings will be built or what final forms or locations will be considered or approved. Nevertheless, this EIR includes in the Illustrative Development Scenario and analyzes a series of buildings that could be constructed pursuant to the 2006 LRDP. As already explained, the sum total of potential development that is included in the Illustrative Development Scenario is greater than would be allowed under the 2006 LRDP, because the Illustrative Development Scenario was developed before the proposed 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. At any particular site, however, the level of development may approach the intensity that is portrayed in the scenario, so the scenario remains an appropriate and conservative basis for evaluating the potential environmental impacts of the proposed 2006 LRDP.

The major new buildings, parking structures, and roads included in the scenario are identified on the scenario map (Figure III-9) and are described in Tables III-6 and III-7. Although it is expected that many aspects of those buildings and their descriptions may change in the future, and although the scenario presents an overall assessment of development greater than would be allowed under the 2006 LRDP, they represent what LBNL expects to be a representative depiction of potential future projects and their associated environmental impacts under the 2006 LRDP. Except for specific projects identified in this chapter as already undergoing CEQA review (such as the Guest House and the User Support Building), the timing, geographic locations, and/or specific building uses, sizes, and designs have not been determined and would be dependent upon research and support needs and the availability of funding, as well as the changing dynamics involved with obtaining such funding.

**TABLE III-6
ILLUSTRATIVE DEVELOPMENT SCENARIO: POTENTIAL NEW BUILDINGS**

Bldg. No.	Description	No. of Occupants	Area (gsf)			Massing	
			Main Bldg.	Support Bldg.	Total Project	Floors	Footprint (sf)
S-1	Office/Computer Research	440	165,000	10,000	175,000	6	65,000
S-2	Not Used	—	—	—	—	—	—
S-3	Lab/Office	435	200,000	15,000	215,000	8	45,000
S-4	Lab/Office	110	50,000	4,000	54,000	4	17,000
S-5	Guest House	70	25,000	0	25,000	3	10,000
S-6	Lab/Office	60	30,000	3,000	33,000	3	13,000
S-7	Accelerator Facility	200	130,000	12,000	142,000	2	106,000
S-8	Shops / Office	65	30,000	4,000	34,000	3	17,000
S-9	Lab/Office	220	100,000	8,000	108,000	3	40,000
S-10	Lab/Office	12	6,000	0	6,000	2	4,000
S-11	Lab/Office	140	89,000	7,000	96,000	6	22,000
S-12	Lab/Office	260	120,000	9,000	129,000	4	32,000
S-13	Lab/Office	220	100,000	8,000	108,000	4	40,000
S-14	Lab/Office	220	100,000	8,000	108,000	6	27,000
S-15	Animal Care Facility	10	7,000	0	7,000	1	7,000
Total			1,152,000	88,000	1,240,000		445,000

gsf – gross square feet; sf – square feet

**TABLE III-7
POTENTIAL NEW PARKING STRUCTURES / LOTS**

No.	Location	Spaces	Area (sf)	Decks	Height (feet)	Footprint (sf)
Structures						
PS-1	Blackberry Canyon	780	260,000	7	70	37,200
PS-2	Life Sciences Area	340	112,000	5	38	22,300
	Sub-Total	1,120	372,000			59,500
Surface Lots						
			Lot Area			
PL-1	Building 90	40	14,000			
PL-2	51 Area	90	31,500			
PL-3	Building 88	25	8,750			
PL-4	Building 58	30	10,500			
PL-5	Building 10	25	8,800			
PL-6	Building 26	90	31,500			
PL-7	ALS Area	75	26,250			
PL-8	Building 72	15	6,000			
PL-9	Redwood Cluster	100	35,000			
PL-10	Strawberry Cluster	120	42,000			
	Sub-Total	610	214,300			
	Total¹	1,730				

sf – square feet

¹ New parking spaces would be constructed while existing parking spaces would be removed so that the total net new parking spaces at the LBNL main site would never exceed 600 spaces.

**TABLE III-8
CONSTRUCTION ACTIVITY LEVELS**

	Anticipated Large Construction Project (24 months total)	Anticipated Sitewide Average Annual Construction Activity Level	Anticipated Peak Construction Annual Average
Construction	100,000 gsf	80,000 gsf	160,000 gsf
Excavation/Grading	7,000 cu. yds.	5,500 cu. yds.	11,000 cu. yds.
Excess Soil for Off-Site Disposal/ Truckloads ¹	600 truckloads	500 truckloads	1,000 truckloads
Foundation	300 truckloads	250 truckloads	500 truckloads
Construction	1,000 truckloads	800 truckloads	1,600 truckloads
Total Truckloads	1,900 truckloads	1,550 truckloads	3,100 truckloads

gsf – gross square feet; cu. yds. – cubic yards

¹ Projects at LBNL often involve cut-fill excavation. The most conservative assumption for analysis, employed here, holds that all excavated soils are transported off-site for disposal. Soil would be hauled in volumes of approximately 12 cubic yards per truck.

The Illustrative Development Scenario includes two projects that have been approved and constructed pursuant to the 1987 LRDP EIR, as amended: the Molecular Foundry (S-11) and the Animal Care Facility (S-15). The scenario also includes several projects that are either currently under consideration and undergoing CEQA review or anticipated to undergo CEQA review in the near future, or likely to be under consideration at some point in the future. These projects are the CRT Building (S-1), the Helios Research Facility (S-12), the Guest House (S-5), the User Support Building (S-6), and the Bevatron demolition project. More details regarding all of these projects are included in this chapter in the discussion entitled “Changes in Baseline Conditions Since 2003” and in Appendix A.

III.E.3 Construction and Demolition

III.E.3.1 Construction

The Illustrative Development Scenario includes ongoing demolition and construction activities over the course of the 20-year planning period. (Such activities are already a common part of Berkeley Lab’s operative routine, as the Lab has been undergoing constant growth, change, or renewal of its physical plant since its inception.) Construction planning for large projects includes consideration of environmental and regulatory elements of each project. (Environmental, health, and safety considerations relevant to construction and demolition operations are discussed in Section IV.F, Hazards and Hazardous Materials, of this EIR.) Construction activities usually include the need for adjacent lay-down areas for equipment, supplies, and fabrication activities, as well as construction-worker parking, typically on or near a job site. Under the 2006 LRDP, construction activities would be similar to current practices. It is expected that, as at present, large construction projects would not often occur simultaneously, although such projects may have some degree of overlap in schedules.

Construction at LBNL typically begins with demolition of existing facilities at a site, if necessary. Site clearing and excavation work follows. If excavation is involved, soil may be shipped off- or on-site during this phase unless the project is a balanced cut-fill excavation. Foundation work, building frame erection, and building finishing are the three major phases to follow. Under optimal conditions, site work for large projects at Berkeley Lab typically is scheduled to occur between the months of April through September for optimal weather conditions, although it may occur in any month of the year, and the remaining phases may also take place at any time during any season.

As with current practices, construction equipment would typically include large vehicles, stationary equipment, and hand-held equipment used on the building site and at nearby staging areas, and would be powered by diesel or gasoline engines or electricity. Such equipment would include scraper/dozers, spreader/compactors, loaders, drill rigs, haul trucks, cement trucks, bore drillers, rough terrain forklifts, pavers, rollers, and other rigs. All equipment would comply with applicable regulatory standards, including required noise, emissions, safety, and energy efficiency standards.

For the purposes of this EIR, the term “construction,” unless specifically indicated otherwise, includes activities that involve construction of new facilities, major rehabilitation or modification of existing facilities, and demolition of existing facilities. The maximum total new construction and renovation under the Illustrative Development Scenario is 1.6 million square feet. This includes 1,240,000 gsf of new occupiable building space construction along with 372,000 gsf of new parking structures. While parking structures are not considered part of the occupiable space totals identified in the 2006 LRDP, they do account for potential construction-related impacts and are thus considered in this EIR analysis. When the projected demolition figure of 440,000 gsf is subtracted from the new occupiable building space total, the net projection for new space – 800,000 net new gsf – is derived. Table III-8 identifies the construction activity level for a typical large construction project, divided into the major phases of construction. A project roughly the size of the Molecular Foundry (approximately 95,000 gsf, plus substantial grading) is used to represent a project of this scale. Because the typical large project at the Lab is projected to take approximately two years to construct, it should be noted that the values in this column in Table III-8 are spread over 24 months and would need to be divided by two in order to translate them into annual figures.

Table III-8 also compares anticipated average and peak annual levels of construction activity, by major phases of construction. For the main site, the annual averages are approximately equivalent to one large construction project being underway at all times at Berkeley Lab and are derived by combining total construction elements of the major projects identified in the Illustrative Development Scenario (e.g., total square footage, footprint square footages, etc.), and then dividing these aggregates evenly over the 20-year planning period. The Lab’s more recent historical construction patterns hold that there are extended periods of little or no major construction interspersed with periods when more than one medium or large construction project may be simultaneously underway. Consequently, an annual peak average is analyzed in this EIR, which is equivalent to the average annual construction level augmented by an additional large-scale construction project. In this way, the peak annual average construction activity level is approximately twice the annual average, or the equivalent of two large construction projects being underway simultaneously. There is no foreseeable year or period of years between 2006 and 2025

when this peak annual average construction activity level is anticipated to occur, if ever. Rather, this level represents the maximum anticipated construction activity level for analytical purposes.

The calculation of excavation-related truck trips assumes the use of 12-cubic-yard haul trucks. Excavation for these projects is assumed to be one-third of a cubic yard of excavated material for each square foot of project footprint, or about nine feet of excavation under the footprint of each building or parking structure identified in the Illustrative Development Scenario. While this ratio is likely to be exceeded with some projects, others would require less excavation or would be balanced cut-fill excavations. Foundations and excavation areas are assumed to be approximately the size of the building footprints identified in the Illustrative Development Scenario. Foundations are assumed to be approximately up to five feet in depth and would be hauled in trucks, each assumed to hold foundation materials of approximately 12 cubic yards. Based on recent experience, a large building project is estimated to require approximately 1,000 truckloads of materials, including steel structural, siding, and interior finishing materials.

The Illustrative Development Scenario and construction estimates are conservative for the purposes of this analysis, meaning that the actual amount of construction would be less than portrayed in the Illustrative Development Scenario. This conservative approach has been taken to ensure that this EIR does not underestimate project impacts. For example, construction levels analyzed in this EIR represent approximately 2.7 times historic levels of construction at Berkeley Lab.

III.E.3.2 Demolition

In addition to construction of new building space, the Illustrative Development Scenario considers for purposes of analysis the possible demolition of up to 440,000 gsf of outdated facilities on the hill site. Demolition is considered for buildings and structures that are seismically poor and not cost-effective to upgrade, no longer suitable for modern science, costly to maintain, and make inefficient use of valuable building sites within the existing developed zone of Berkeley Lab. As of 2004, more than 60 percent of LBNL buildings were more than 40 years old, and 5 percent were over 60 years old, beyond the effective age of a typical laboratory building. Additionally, many of these buildings were constructed as temporary structures but were never removed or replaced. A substantial portion of these buildings is concentrated in two areas: the Bevatron area, where the Laboratory currently seeks funding and approval from DOE to demolish the former accelerator facility at Building 51; and near the Advanced Light Source, in the area of the Lab known as “Old Town.” The Bevatron, in Building 51, was among the world’s leading particle accelerators during its operation from 1954 until 1993, and contributed significantly to particle and nuclear physics.²⁰ The Old Town area surrounding the Advanced Light Source

²⁰ Building 51 is an approximately 126,500-gross-square-foot structure built to shelter the Bevatron apparatus and its associated mechanical, electrical, shop, and office functions. Under the demolition project, the concrete shielding blocks that surround the Bevatron would be removed, the Bevatron apparatus would be disassembled, Building 51 and the shallow foundation underneath the building would be demolished, and the resulting debris and other materials would be removed. The site would then be backfilled, and the fill compacted and leveled. Berkeley Lab completed a Draft EIR for the demolition of Building 51 complex in November 2005, tiered from the 1987 LRDP EIR, as amended. Certification of the Bevatron EIR and approval of the demolition project are anticipated to be considered in early 2007. For purposes of this EIR, the Building 51 complex is considered part of the existing setting, and the Bevatron demolition project is incorporated into this EIR as the “anticipated large demolition project” for analytical purposes.

(Building 6) includes many early Lab buildings that are currently outdated and underused. This area contains World War II-era buildings that are not suitable for modern science and are no longer fully functional. The average age of these small-scale wooden scientific buildings is 55 years; their removal would create a large 5.5-acre site available for modern research structures.

In general, the 2006 LRDP foresees demolition of buildings that “can no longer reasonably meet modern mission needs and should be removed to make way for new modern structures.” Redevelopment of such buildings would allow not only for physical upgrade of the Lab, but would also provide opportunities for increased building efficiency, improvements to site circulation and utility systems, and implementation of sustainable design practices. In many cases, the Laboratory would demolish surplus or outdated facilities prior to the identification of particular replacement buildings. The Laboratory would upgrade utilities and roadways in order to create “plug-in” development sites within the central core of the Laboratory.

Active demolition project phases at LBNL generally proceed as follows: (1) contents of the building are characterized; (2) hazards, if any are present, are abated, including asbestos-containing materials and lead-based paint; (3) reusable and recyclable materials are identified and removed; (4) the structure is demolished and removed; (5) foundation and utilities may be removed; and (6) any holes are filled, the site is graded as necessary, and the site is landscaped or reused.

Demolition equipment would include large vehicles, stationary equipment, and hand-held equipment similar to that involved in construction.

Table III-9 identifies the major phases of demolition of a project roughly the size of the Building 51 demolition in order to conservatively represent a large-scale demolition project. The table compares anticipated average and peak annual average levels of demolition activity, broken out into principal demolition parameters for analysis. As with construction, the annual average is derived by dividing the total by the 20-year planning period. The calculation of truck trips assumes 10-ton haul trucks.

**TABLE III-9
DEMOLITION ACTIVITY LEVELS**

	Anticipated Large Demolition Project 12-Month Peak Activity Level	Anticipated Average Annual Demolition Activity Level	Anticipated Peak Annual Demolition Activity Level
Gross Square Feet	32,000 gsf	22,000 gsf	54,000 gsf
Weight (125 lbs/sf)	2,000 tons	1,375 tons	3,375 tons
Truck Trips Subtotal	200 truckloads	140 truckloads	340 truckloads
Shielding Blocks	400 truckloads	50 truckloads	450 truckloads
Total Truckloads	600 truckloads	190 truckloads	790 truckloads

gsf – gross square feet; sf – square feet; lbs – pounds

Similar to construction activity, in the Lab’s more recent historical demolition patterns, there have been extended periods of little or no major demolition interspersed with periods where more than one medium or large demolition project is underway. Consequently, a peak annual average is analyzed in this EIR, which is roughly equivalent to the average annual demolition level augmented by the addition of a large-scale demolition project during its peak 12-month phase. The peak annual average demolition activity level is greater than four times the calculated annual average. Because there are no other demolition projects identified that would approach the scale of the Bevatron, it is anticipated that the peak demolition level would only be achievable in a year during which Bevatron demolition is taking place.

Building demolition proposed under the Illustrative Development Scenario is identified in Table III-10.

**TABLE III-10
ILLUSTRATIVE DEMOLITION PROGRAM**

Bldg.	Area ¹	Ref. ²	Bldg.	Area ¹	Ref. ²	Bldg.	Area ¹	Ref. ²	Bldg.	Area ¹	Ref. ²
70A	3,000	S1	71J	1,280	S4	44	805	S7	67B	1,238	Tmp
70E	432	S1	71K	470	S4	44A	481	S7	67C	1,237	Tmp
51B	44,000	S3	71P	500	S4	44B	1,441	S7	76K	425	Tmp
51	96,566	S3	71Q	350	S4	52	6,425	S7	76L	1,439	Tmp
51A	28,462	S3	29A	1,751	S5	52A	516	S7	90J	2,846	Tmp
51F	1,499	S3	29B	1,440	S5	75A	4,000	S8	90K	2,844	Tmp
64	28,179	S3	29C	1,440	S5	69	20,400	S8	75B	4,640	Tmp
64B	480	S3	29D	276	S5	31	7,300	S9	75C	450	Tmp
90B	1,443	S3	10	15,000	S6	31A	600	S9	75D	1,895	Tmp
90C	1,193	S3	4	10,176	S7	31B	150	S9	75E	410	Tmp
90F	2,462	S3	5	7,176	S7	31C	150	S9	50C	2,766	Exc
90G	1,853	S3	7	21,433	S7	62*	10,000	S12	50D	4,959	Exc
90H	1,921	S3	7A	128	S7	62A	1,238	S12	61	323	Exc
90P	2,129	S3	7C	479	S7	73A	403	S12	70G	173	Exc
90Q	425	S3	14	4,201	S7	83	6,995	S14	74F	1,560	PS-1
90R	160	S3	16	11,808	S7	83A	538	S14	17	2,222	S7
71A	4,000	S4	16A	339	S7	85B	3,603	S14	27	3,299	S7
71C	500	S4	25	20,306	S7	46B	1,239	Tmp	53	6,944	S7
71D	500	S4	25A	7,548	S7	46C	1,029	Tmp	53B	519	S7
71E	500	S4	25B	360	S7	46D	775	Tmp			
71F	500	S4	40	993	S7	65B	1,020	Tmp			
71G	500	S4	41	995	S7	65A	1,454	Tmp			
										Total Demolition	
										439,904 gsf³	

¹ In gross square feet (gsf)

² Ref. (Reference):

S1 – S14 and PS-1 – PS-3 are Illustrative Development Scenario buildings that might require the existing building demolition indicated on the above table.

“Tmp” indicates temporary buildings, such as trailers.

“Exc” indicates excess buildings.

* indicates a building that would be partially demolished.

³ As previously noted, overall demolition pursuant to the 2006 LRDP is limited to 320,000 gross square feet of existing space. Thus, all of the demolition listed in this table cannot be carried pursuant to the 2006 LRDP, although a variety of combinations of potential demolition projects could be carried out, and any single demolition project set forth in this table could be implemented based on the 2006 LRDP.

III.E.3.3 Renovation

When a built space becomes outdated, obsolete, or otherwise unable to serve its intended mission, that space becomes a candidate for demolition or for adaptive reuse to serve another mission or need. The latter process is considered “renovation.” Up to 600,000 gsf of current LBNL built space that is not planned for demolition in the 2006 LRDP will be obsolete or more than 50 years old by the year 2025 and will be in need of renovation during the planning period. This analysis assumes that renovation would take place at an average of 30,000 gsf per year, with up to 60,000 gsf being renovated during a peak year. Renovation projections are included in addition to construction figures for this analysis.

Renovation includes installation, replacement, or upgrading of HVAC (heating, ventilation, and air conditioning) systems, electrical systems up to 480 volts, elevators, windows, flooring, roofs, interior building fixtures, and insulation. It includes repairs and repainting of building interiors and exteriors. It is also necessary for upgrading buildings to meet seismic and Americans with Disabilities Act (ADA) regulations. Renovation involves general low-level construction and maintenance activities and often includes small or hand-held tools, shop tools, material handling equipment, and occasionally cranes and trucks.

III.E.3.4 Combined Construction and Demolition Activities

Cumulative impacts of construction and demolition are analyzed in this EIR by considering the impacts of aggregate average and peak annual construction and demolition activities, along with in- and out-bound trucks associated with those activities (see Table III-11).

**TABLE III-11
CONSTRUCTION AND DEMOLITION ACTIVITIES**

	Average Annual Demolition	Average Annual Construction	Average Annual Renovations	Total Average Annual¹
Square Feet	22,000	80,000	30,000	132,000
Truckloads	190	1,550	300	2,000
	Peak Annual Demolition	Peak Annual Construction	Peak Annual Renovations	Total Peak Annual¹
Square Feet	54,000	160,000	60,000	274,000
Truckloads	790	3,100	600	5,000

¹ Numbers rounded.

III.E.3.5 Facilities Maintenance

In addition to the construction and replacement activities described above and elsewhere throughout this document, Berkeley Lab would continue to carry out routine maintenance, repairs, and improvements to its buildings, equipment, and grounds as part of normal facility management through 2025. Under the proposed 2006 LRDP, these activities would be expected

to incrementally increase as Lab population and space increases. Facilities maintenance and other operations and logistical spaces would provide for operating, maintaining, and repairing the Lab's buildings and grounds. Such spaces include wood, metal, machine, and paint shops; materials delivery and storage areas; construction staging and laydown areas; vehicle and equipment depots; utility banks and buildings; waste handling facilities; and cleaning facilities.

III.F. Required Project Approvals and Intended Uses of This EIR

LBNL is a federal facility operated by the University of California and conducting work within the University's mission on land owned or controlled by the University. The Board of Regents is the University's decision-making body and is responsible for approving the 2006 LRDP and the physical facilities to be constructed on University-owned land. The Regents will review and consider this EIR in conjunction with review and consideration of the 2006 LRDP. It is anticipated that these documents would be presented for The Regents' consideration and approval at one of the 2007 Regents meetings after the Lab has prepared a Final EIR including responses to all of the comments that have been submitted. In addition, the Berkeley Lab Design Guidelines, which are referenced in this EIR and included in Appendix B, are proposed to be adopted by the Lab as a companion document to the 2006 LRDP.

This EIR is intended to be used for the following actions, and will serve the following purposes:

- 1) The EIR provides The Regents with information upon which to evaluate the environmental implications of the LBNL 2006 LRDP, including environmental impacts and mitigation measures that could avoid some of those impacts, and the EIR will be used as the CEQA document for The Regents' consideration of the 2006 LRDP, and the adoption of required findings and other actions by The Regents in connection with their consideration and possible adoption of the 2006 LRDP.
- 2) The EIR will also be utilized in connection with the consideration by the Lab and/or by The Regents of specific projects pursuant to the 2006 LRDP, and possibly for the later modification of such projects. Pursuant to CEQA Guidelines Section 15168 and as described in Chapter I (Introduction), some projects may be approved as within the scope of this EIR and other projects will be approved after a second-tier CEQA document is prepared. Any use of this EIR in connection with subsequent approval is subject to two additional restrictions, also described in Chapter I, that resulted from consultations with the City of Berkeley. This EIR will not be used as the first-tier EIR for (or otherwise to streamline review of) any project exceeding a net total of 980,000 gross square feet of new occupiable (research and support) space construction or 320,000 gross square feet of demolition, and a new traffic study will be prepared on the earliest to occur of ten years after this EIR is certified or the date on which development at the Lab pursuant to the 2006 LRDP reaches 375 net new parking spaces.
- 3) Consistent with the use of this EIR for specific projects pursuant to CEQA *Guidelines* Section 15168, this EIR will also provide information to responsible agencies with permitting or approval authority over projects that may be implemented under the 2006 LRDP, including the potential approvals listed under "permitting and approvals" below; and

- 4) This EIR is also intended to be used by the University, consistent with the provisions of CEQA, in connection with other specific actions that may be necessary or desirable to approve and implement the 2006 LRDP.

III.F.1 NEPA

The National Environmental Policy Act of 1969 (NEPA; 42 USC 4321–4347) requires federal agencies to consider the environmental effects of, and alternatives to, proposals for major federal actions that would significantly affect the quality of the human environment. In connection with a subsequent development project proposed to be carried out under the 2006 LRDP (e.g., construction of a particular research laboratory or other similar building), if also subject to an authorization or decision of DOE or another federal agency, that project will undergo a review by the relevant federal agency to determine the appropriate level of NEPA documentation, based on the project’s reasonably foreseeable environmental impacts. Typically, projects carried out under the 2006 LRDP will receive NEPA as well as CEQA review. NEPA review is not required in those few cases where a federal agency authorization to undertake the action is not involved (for example, where construction takes place on a non-DOE leased parcel at LBNL and without federal funding).

The 2006 LRDP is a University-mandated planning document. Although the Lab is operated by the University for DOE, DOE does not require this state-mandated document. Thus, the 2006 LRDP does not constitute a “federal action” subject to NEPA review.

III.F.2 Permitting and Approvals

The only agency approval – federal, state, or local – required for adoption of the 2006 LRDP and of this program-level EIR is that of The Regents of the University of California. Shortly following The Regents’ action, it is anticipated that the Lab will adopt the proposed Berkeley Lab Design Guidelines as a companion document to the LRDP. Action by other agencies is not required to adopt the 2006 LRDP or the Berkeley Lab Design Guidelines. Nevertheless, under limited circumstances and as individual development projects move forward, other permits and approvals may be required or voluntarily sought by LBNL. These include the following:

Section 404 Permit: Although not anticipated at this time, implementation of the 2006 LRDP could result in the filling of wetlands and other waters of the United States. The U.S. Army Corps of Engineers regulates the nation’s waterways and wetlands, and is responsible for implementing and enforcing Section 404 of the federal Clean Water Act. Corps of Engineers regulations require that any activity that discharges fill material or requires excavation in “waters of the United States,” including wetlands, must obtain a Section 404 permit.

Section 401 Water Quality Certification: The State Water Resources Control Board and the Regional Water Quality Control Boards (RWQCBs) promulgate and enforce narrative and numeric water quality standards in order to protect water quality and adopt and approve Water Quality Control Plans. The State Board and the RWQCBs also regulate discharges of harmful substances to surface waters, including wetlands, under the federal Clean Water Act and the

California Porter-Cologne Water Quality Control Act. If issuance of a Section 404 permit is required, it will be subject to water quality certification under Clean Water Act Section 401.

Section 7 Consultation: The Federal Endangered Species Act requires a federal agency (potentially the Army Corps of Engineers if issuance of a Section 404 permit is required) to seek formal consultation with the U.S. Fish and Wildlife Service (USFWS) for any action that may result in the “take” of a species listed as threatened or endangered, or proposed for listing as threatened or endangered. Based on this consultation, the USFWS issues a biological opinion determining whether the project is likely to adversely affect or jeopardize the continued existence of a federally listed species, or result in the destruction or adverse modification of critical habitat proposed to be designated for such species. Section 7 consultation may also be required for any project that receives federal funding.

Section 10 of the Endangered Species Act: Section 10 of the Federal Endangered Species Act provides a nonfederal applicant a mechanism to obtain incidental take authorization for federally listed threatened or endangered species.

Section 106 Compliance: For projects with federal funding, the National Historic Preservation Act of 1966 (NHPA), as amended by 16 United States Code section 470 et seq., Section 106, 36 Code of Federal Regulations (CFR) 800, includes provisions for protection of significant archaeological and historical resources. Procedures for dealing with previously unsuspected cultural resources discovered during construction are identified in 36 CFR 800 (for implementing Section 106 processes). The administering agency is the State Historic Preservation Officer (SHPO) and the federal lead agency.

Section 1601 Permit: The California Department of Fish and Game (CDFG) requires notification for any project or activity that will take place in, or in the vicinity of, a river, stream, lake, or its tributaries. Section 1601 (1603 for private entities) of the Fish and Game Code requires that state or local governmental agencies notify the CDFG before they begin any construction project that will (1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; (2) use materials from a streambed; or (3) result in the disposal or disposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake.

Section 2081 Compliance: Section 2081 of the California Endangered Species Act permits the “take” (hunt, pursue, catch, or kill) of endangered or threatened species, provided that the take is incidental to an otherwise lawful activity, the impacts of the authorized take are minimized and fully mitigated, the take permit is consistent with the CDFG recovery programs, the applicant ensures adequate funding to implement the mitigation and monitoring program, and the action will not jeopardize the continued existence of the species. Substantial information regarding state-listed species is presented in Section IV.C, Biological Resources, of this EIR.

NPDES Permits: The Clean Water Act requires a National Pollutant Discharge Elimination System (NPDES) permit for any discharge of pollutants from a point source to waters of the United States. This law and its regulations also apply to stormwater in certain circumstances. In

1987, Congress amended the Clean Water Act to require implementation, in two phases, of a comprehensive national program for addressing stormwater discharges. Phase I requires NPDES permits for stormwater discharge from a large number of priority sources, including medium and large municipal separate storm sewer systems, and several categories of industrial activity, including construction activity that disturbs five or more acres of land. Phase II of the stormwater program requires permits for stormwater discharges from certain small municipal separate storm sewer systems and construction activity generally disturbing between one and five acres. The Lab is subject to Phase II regulations.

Other Permits and Approvals: A variety of other permits and approvals from federal, state, and local agencies may be needed for future projects, or for implementation of project mitigation. These may include encroachment permits and approvals from infrastructure providers for service and extension of facilities to the Berkeley Lab or its new programs and projects.