CHAPTER V
Alternatives

V.A. Introduction

CEQA requires that an EIR include an evaluation of the comparative effects of "a reasonable range of potentially feasible alternatives" to the project. One of the primary criteria for selecting the alternatives to be considered is that such alternatives "would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project" (CEQA Guidelines Section 15126.6(a)). The range of alternatives is governed by the "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice (CEQA Guidelines Section 15126.6(f)). Evaluation of a No Project Alternative and identification of an environmentally superior alternative are required. The significant effects of the alternatives shall be discussed, but in less detail than the significant effects of the proposed project (CEQA Guidelines Section 15126.6(d)).

This chapter includes the required analysis of alternatives to the project, as well as information explaining how the alternatives were selected. This chapter begins with this introduction, which lists the significant and unavoidable impacts identified in the previous chapters of the EIR, as the ability to avoid or reduce one or more of these unavoidable impacts is one of the factors considered in evaluating potential alternatives for analysis in this EIR. The second part of this introduction describes the factors that were used in selecting alternatives, and lists the alternatives that are analyzed. The sections of this chapter following the introduction are organized as follows:

- Section V.B describes several possible alternatives that were initially considered for analysis in this EIR, but that were rejected from further analysis. This section includes an explanation of the reasons that these alternatives were rejected from detailed consideration.
- Sections V.C through V.G of this chapter set forth the detailed analysis of alternatives.
- Finally, Section V.H lists the references that were used in preparing the alternatives chapter.

V.A.1 Significant and Unavoidable Impacts

As discussed in Chapter IV, implementation of the LRDP would result in the following significant and unavoidable impacts:

V.A.1.1 Aesthetics

Impact 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.

Impact 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.

V.A.1.2 Air Quality

Cumulative Impact 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.

V.A.1.3 Cultural Resources

Impact 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.

V.A.1.4 Noise

Impact NOISE-1: Development under the proposed LRDP would result in temporary noise impacts related to construction and demolition activities.

Cumulative Impact NOISE-5: Development under the proposed LRDP would result in temporary contributions to cumulative noise impacts related to construction and demolition activities.

V.A.1.5 Transportation

Impact TRANS-1: Implementation of the 2006 LRDP would degrade level of service at certain local intersections.

Cumulative Impact 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.

V.A.2 Alternatives Analyzed in this EIR

The project alternatives selected for evaluation would have the potential to lessen or avoid one or more of the identified significant and unavoidable impacts of the 2006 LRDP. The alternatives addressed in this EIR were selected in consideration of one or more of the following factors:

- The extent to which the alternative would accomplish most of the basic objectives of the project (identified in Chapter III);
- The extent to which the alternative would avoid or lessen any of the identified significant adverse environmental effects of the project;
- The feasibility of the alternative, taking into account site suitability, economic viability, availability of infrastructure, consistency with regulatory limitations, and the reasonability of the project sponsor's acquiring or controlling the site;
- The appropriateness of the alternative in contributing to a "reasonable range" of alternatives necessary to permit a reasoned choice;
- The CEQA Guidelines requirement to consider a "no project" alternative as well as an "environmentally superior" alternative (CEQA Guidelines Section 15126.6); and
- The responsiveness of the alternative to requests and suggestions from the public scoping process.

This chapter discusses the following alternatives to the proposed project:

1) No Project Alternative;
2) Reduced Growth 1 Alternative;
3) Reduced Growth 2 Alternative;
4) Preservation Alternative with Non-LBNL Use of Historical Resources; and
5) Off-Site Alternative.

A description of these alternatives is provided below, as well as a discussion of their potential impacts compared to those of the proposed project. These alternatives are presented in tabular form in Table V-1, and impacts of each alternative are compared to those of the project in Table V-2.

The CEQA Guidelines suggest that an EIR briefly describe the rationale for selecting the alternatives to be discussed and identify any alternatives that were considered by the lead agency but were rejected as infeasible (Section 15126.6(c)). Alternatives examined in the initial review of potential alternatives, but rejected from further consideration because they were determined either to be infeasible or to offer no significant environmental benefits over the 2006 LRDP or the alternatives identified above, are discussed in the subsequent subsection.

Of the alternatives assessed in this EIR, the environmentally superior alternative, that is the alternative with the least environmental impact, is the No Project Alternative. Section 15126.6(e)(2) of the CEQA Guidelines directs that if the environmentally superior alternative is the no project alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. Other than the No Project Alternative, the Reduced Growth 1 Alternative is the environmentally superior alternative, because it would reduce the significant and unavoidable impacts associated with the project more than would the other alternatives.

TABLE V-1
COMPARISON OF PROJECT AND ALTERNATIVES

	New Occupiable Building Construction (gsf)	Demolition (gsf)	Net New Occupiable Building Space (gsf)	Net New Parking Spaces	New ADP
Proposed LRDP Project	980,000	(320,000)	660,000	500	1,000
Illustrative Development Scenario[a]	*1,240,000*	*(440,000)*	*800,000*	*600*	*1,150*
No Project Alternative	455,200	(215,200)	240,000	0	375
Reduced Growth 1 Alternative	655,800	(239,600)	416,200	375	760
Reduced Growth 2 Alternative	915,000	(325,000)	590,000	375	1,025
Preservation Alternative with Non-LBNL Use of Historical Resources	980,000	(320,000)	660,000	500	1,000
Off-Site Alternative					
LBNL Hill Site	655,800	(239,600)	416,200	375	760
Richmond Field Station	383,800	0	383,800	225	390

gsf – gross square feet; ADP – adjusted daily population

[a] The Illustrative Development Scenario is a conceptual portrayal of potential development under the LRDP. The scenario, developed before the proposed 2006 LRDP was reduced in scope in response to comments from the City of Berkeley, is intended to provide a conservative basis for the analysis of environmental impacts, and actual development that is proposed for approval and construction pursuant to the LRDP is reflected under "Proposed LRDP Project" in the table.

TABLE V-2
SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance *after mitigation* and indicate maximum impact during buildout and operation, unless otherwise specified.	**Project**	**No Project**	**Reduced Growth 1**	**Reduced Growth 2**	**Preservation (Non-LBNL Use of Hist. Res.)**	**Off-Site**
Aesthetics						
VIS-1: Construction of the proposed LRDP buildings would create temporary aesthetic nuisances for adjacent land uses.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
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.	SU	LTS⇩	SU⇩	SU⇔	SU⇔	SU⇩
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.	SU	LTS⇩	SU⇩	SU⇔	SU⇔	SU⇩
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.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
Air Quality						
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.	LSM	LSM⇩	LSM⇩	LSM⇩	LSM⇔	LSM⇔
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.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇔
AQ-3: Proposed development under the LBNL 2006 LRDP would increase carbon monoxide concentrations at busy intersections and congested roadways in the project vicinity.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩
AQ-4: Implementation of the proposed 2006 LRDP would expose people to toxic air contaminants.	LSM	LSM⇩	LSM⇩	LSM⇩	LSM⇔	LSM⇩
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.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇔

LTS – Less than significant
LSM – Less than significant with mitigation
SU – Significant and unavoidable

⇩ Impact less substantial than that of project
⇧ Impact more substantial than that of project
⇔ Impact comparable to that of project

TABLE V-2 (Continued)
SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance *after mitigation* and indicate maximum impact during buildout and operation, unless otherwise specified.	**Project**	**No Project**	**Reduced Growth 1**	**Reduced Growth 2**	**Preservation (Non-LBNL Use of Hist. Res.)**	**Off-Site**
Air Quality (cont.)						
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.	SU	SU⇩	SU⇩	SU⇩	SU⇔	SU⇔
Biological Resources						
BIO-1: Development proposed under the 2006 LRDP would result in the permanent and/or temporary removal of some existing vegetation.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
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.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇔
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.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
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.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
BIO-5: Implementation of the 2006 LRDP could result in take or harassment of Alameda whipsnakes.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
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 Service 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.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩

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TABLE V-2 (Continued)
SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance *after mitigation* and indicate maximum impact during buildout and operation, unless otherwise specified.	**Project**	**No Project**	**Reduced Growth 1**	**Reduced Growth 2**	**Preservation (Non-LBNL Use of Hist. Res.)**	**Off-Site**
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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
Cultural Resources						
CUL-1: Implementation of the 2006 LRDP would 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.	SU	SU⇩	SU⇔	SU⇔	LTS⇩	SU⇔
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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
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.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇔
CUL-4: Implementation of the proposed 2006 LRDP could disturb human remains, including those interred outside of formal cemeteries.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇔
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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇩	LTS⇔
Geology and Soils						
GEO-1: Future construction projects within the Alquist-Priolo Zone could expose people or structures to surface fault rupture.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
GEO-2: Implementation of the LRDP would expose people and structures to seismic hazards such as groundshaking and earthquake-induced landsliding.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
GEO-3: Implementation of the LRDP would result in construction on soils that could be subject to erosion and instability.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
GEO-4: The proposed 2006 LRDP, when combined with cumulative growth, would increase the population exposed to geologic and seismic hazards.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩

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SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance *after mitigation* and indicate maximum impact during buildout and operation, unless otherwise specified.	**Project**	**No Project**	**Reduced Growth 1**	**Reduced Growth 2**	**Preservation (Non-LBNL Use of Hist. Res.)**	**Off-Site**
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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
HAZ-2: Future construction activities, including earth-moving activities such as excavation and grading, could expose construction workers or the environment to hazardous materials.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
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.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇔
HAZ-4: Implementation of the LRDP would involve the handling of hazardous materials and wastes within one-quarter mile of an existing school.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
HAZ-6: Implementation of the LRDP would expose people or structures to wildland fire hazards.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
HAZ-7: Implementation of the LRDP would contribute to cumulative increases in exposure to hazards and hazardous materials.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
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.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩
HYDRO-2: Implementation of the 2006 LRDP would adversely affect stormwater quality.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩
HYDRO-3: Implementation of the LRDP would increase stormwater runoff rates and volumes, potentially resulting in erosion of creek channels or downstream flooding.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩

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Hydrology and Water Quality (cont.)						
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.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩
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.	LTS	LTS⇩	LTS⇔	LTS⇔	LTS⇔	LTS⇔
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.	LTS	LTS⇩	LTS⇔	LTS⇔	LTS⇔	LTS⇔
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.	LTS	LTS⇩	LTS⇔	LTS⇔	LTS⇔	LTS⇔
Noise						
NOISE-1: Development under the proposed LRDP would result in temporary noise impacts related to construction and demolition activities.	SU	LTS⇩	SU⇩	SU⇔	SU⇔	SU⇩
NOISE-2: Development under the proposed LRDP would result in temporary vibration impacts related to construction activities.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
NOISE-4: Continued operation of the LBNL hill site facility would result in a long-term increase in ambient noise levels.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
NOISE-5: Development under the proposed LRDP would result in temporary contributions to cumulative noise impacts related to construction and demolition activities.	SU	SU⇩	SU⇩	SU⇔	SU⇔	SU⇩

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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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
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 2005 LRDP to this impact would not be cumulatively considerable.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇔
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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
PUB-3: Implementation of the 2006 LRDP would not result in the need for new or physically altered public school facilities.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
PUB-4: Implementation of the proposed 2006 LRDP would not adversely affect the provision of parks and recreation.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
PUB-7: Under cumulative conditions, implementation of the proposed 2006 LRDP would not substantially affect the provision of parks and recreation facilities.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩

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TABLE V-2 (Continued)
SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance *after mitigation* and indicate maximum impact during buildout and operation, unless otherwise specified.	**Project**	**No Project**	**Reduced Growth 1**	**Reduced Growth 2**	**Preservation (Non-LBNL Use of Hist. Res.)**	**Off-Site**
Transportation/Traffic						
TRANS-1: Implementation of the 2006 LRDP would degrade level of service at certain local intersections.	SU	LTS⇩	SU⇩	SU⇩	SU⇔	SU⇩
TRANS-2: Implementation of the 2006 LRDP would result in minor increases in transit ridership.	LTS	LTS⇩	LTS⇩	LTS⇧	LTS⇔	LTS⇩
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.	LSM	LSM⇩	LSM⇩	LSM⇧	LSM⇔	LSM⇩
TRANS-4: Implementation of the 2006 LRDP would increase parking demand but would provide additional parking that would be adequate to meet this demand.	LTS	LTS⇩	LTS⇔	LTS⇧	LTS⇔	LTS⇔
TRANS-5: Implementation of the 2006 LRDP would marginally increase potential traffic conflicts with pedestrians or bicyclists.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩
TRANS-6: Construction of new facilities proposed under the 2006 LBNL LRDP would temporarily and intermittently increase traffic volumes above current conditions.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩
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.	LTS	LTS⇩	LTS⇩	LTS⇩	LTS⇔	LTS⇩
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.	SU	LTS⇩	SU⇩	SU⇩	SU⇔	SU⇩
Utilities, Service Systems, and Energy						
UTILS-1: Implementation of the proposed 2006 LRDP would increase the demand for water.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
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	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
UTILS-3: Development proposed under the 2006 LRDP would generate solid waste, but would not require new facilities.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩

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TABLE V-2 (Continued)
SUMMARY OF IMPACTS: PROJECT AND ALTERNATIVES

NOTE: Significance levels shown in the table reflect levels of significance *after mitigation* and indicate maximum impact during buildout and operation, unless otherwise specified.	**Project**	**No Project**	**Reduced Growth 1**	**Reduced Growth 2**	**Preservation (Non-LBNL Use of Hist. Res.)**	**Off-Site**
Utilities, Service Systems, and Energy (cont.)						
UTILS-4: On-site construction due to development proposed under the 2006 LDRP would generate construction waste and debris.	LSM	LSM⇩	LSM⇩	LSM⇔	LSM⇔	LSM⇩
UTILS-5: Development proposed under the 2006 LDRP 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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩
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.	LTS	LTS⇩	LTS⇩	LTS⇔	LTS⇔	LTS⇩

LTS – Less than significant
LSM – Less than significant with mitigation
SU – Significant and unavoidable

⇩ Impact less substantial than that of project
⇧ Impact more substantial than that of project
⇔ Impact comparable to that of project

V.B. Alternatives Considered and Rejected

V.B.1 Preservation Alternative with LBNL Use of Historical Resources

Because the EIR identified significant, unavoidable impacts of the proposed 2006 LRDP on historical resources due to the proposed demolition of Buildings 51 and 51A (housing the Bevatron, and collectively known as the Building 51 complex) and the potential demolition of other potential historic buildings that might in the future become eligible for the National Register of Historic Places (Impact CUL-1), a Preservation Alternative was considered whereby LBNL would retain and continue to use Building 51 and other historical resources. Two options were considered for this alternative. In the first option, the Bevatron and other historic elements of the Building 51 complex would be preserved, as would other structures at LBNL that were determined, following analysis by a qualified professional and consideration by the State Historic Preservation Officer, to be eligible for the National Register of Historic Places or the California Register of Historical Resources. The second option would entail retention of as much of the Building 51 structure and other historical resources as practical, but would include removal from these buildings of existing equipment that the Lab has determined to no longer be practically or feasibly useful. This equipment to be removed would include, for example, the Bevatron and other unused equipment within Building 51. Under this option, new offices or laboratories would be constructed inside a given historic structure, structural and mechanical systems upgrades would be performed as needed, and hazardous materials remediation would be conducted in accordance with applicable laws and regulations.

Under this alternative, buildings at LBNL determined to be historical resources under CEQA would be renovated and reused for future Lab activities or, where such reuse is not feasible due to the specific design or configuration of a building, or where equipment to be retained could preclude such reuse, that the building would be "mothballed"[1] in accordance with National Park Service guidelines for future reuse consideration.

Other than retention and possible rehabilitation and reuse of certain historic structures, this alternative is assumed to include the same development program as the proposed 2006 LRDP; that is, an increase in LBNL adjusted daily population (ADP) from 4,375 to 5,375 and an increase in building square footage of approximately 660,000 gross square feet (gsf) on the main hill site. Therefore, other than avoiding impacts to historical resources, this alternative would have essentially the same impacts as would the proposed project (the 2006 LRDP), because growth in both ADP and building area would be the same as with the project. This would be particularly true for impacts related to the intensity of development (i.e., traffic and other transportation-related impacts, air quality and noise resulting from operations, use of hazardous materials and generation of hazardous waste, population and housing demand, and demand for public services and utilities). While preservation of certain historic buildings could result in incremental changes

[1] "Mothballing" is a process of closing up a building temporarily to protect it from weather as well as to secure it from vandalism. It can be a necessary and effective means of protecting the building while planning the property's future, or raising money for a preservation, rehabilitation or restoration project (NPS, 1993).

in so-called "footprint" impacts (i.e., effects on views and other aesthetic impacts, effects on biological resources, the increase in impervious surface and resulting increase in stormwater runoff, siting of buildings relative to unstable soils and earthquake faults, and construction noise impacts on nearby sensitive receptors), the changes with this alternative would likely be imperceptible, compared to impacts of the proposed 2006 LRDP, because most buildings at the Lab are not National Register-eligible, and therefore most of the LBNL hill site would be treated in the same manner under this alternative as under the proposed 2006 LRDP.

The first option under this Preservation Alternative is infeasible because old special-purpose buildings such as the Building 51 complex cannot be reused by LBNL in a cost-effective manner once they have outlived their original usefulness. That is, unlike a standard commercial or residential building, a building constructed to house, for example, a particle accelerator, cannot be readily adapted to a completely different use in the service of a technology that did not exist when the building was built. Also, retention of the Bevatron, which occupies most of the building, would preclude efficient reuse of Building 51. Similarly, it is likely that, to the extent that buildings other than the Building 51 complex are determined to be historical resources under CEQA, their adaptive reuse may not be feasible, because of either economic or technical concerns, or both.

Furthermore, specifically with regard to Building 51, that building is seismically inadequate, it has begun to deteriorate with age, and it is increasingly taxing on maintenance resources. It has become costly to maintain and repair the mostly unused facility and, without repairs, it would eventually become a structural hazard. Therefore, retention of Building 51 (and 51A) for reuse by LBNL is infeasible. For these and other reasons, demolition of the Building 51 complex and Bevatron has already been the subject of a separate EIR. Certification of that EIR is anticipated to be considered in early 2007.

Moreover, of other buildings at the Lab, only Building 71 and Building 88 have been preliminarily identified as potentially historic, and the 2006 LRDP does not anticipate demolition of these structures. Thus, this Preservation Alternative could avoid demolition of only one definitely known historical resource (the Building 51 complex); however, since reuse of this building complex is infeasible for the reasons described above, LBNL and the DOE are pursuing demolition of the Building 51 complex.

Under the second option (retention of building shells and removal of equipment), with specific regard to Building 51, this alternative would not avoid the significant impacts to historic resources associated with the proposed project. This is because, while the structure would remain, this option would entail removal of the Bevatron equipment, which itself is a historical resource. The original building was designed as a large shed to enclose a unique piece of equipment (i.e., the Bevatron). With the removal of this integral piece of scientific equipment (the Bevatron), the building would not retain sufficient integrity to remain listed in the National Register or California Register. Substantial alterations to a historic building's integrity would be a significant impact under CEQA. As such, impacts to historic resources would be significant and unavoidable under this variant of this alternative.

In light of the above, the Preservation Alternative with LBNL Use of Historical Resources has been rejected from further consideration.

V.B.2 No Growth Alternative

This alternative would constitute a freeze on growth in both population (ADP) and occupiable building space at Berkeley Lab. Existing activities would continue and new activities could be undertaken to the extent that they would not require an increase in either ADP or the demolition of existing structures or new construction of replacement structures. Parking would not be increased on the hill site.

Under this alternative, none of the impacts identified in Chapter IV related to the intensity of development would occur. That is, there would be no increase in traffic or demand for other transportation modes, no increase in emissions or noise resulting from operations, no change in population or housing demand, and no increased demand for public services and utilities, nor would there be any meaningful change in use of hazardous materials and generation of hazardous waste. No impacts relating to aesthetics, biological resources, geology, hydrology, or and construction-period impacts would occur as no demolition or new construction would occur under this alternative. This alternative would also avoid the proposed project's significant and unavoidable aesthetic, noise and traffic impacts, but would not necessarily avoid effects on historical resources, as it assumed that, under this alternative, the Building 51 complex (Bevatron) would be demolished, to make room for modern, functional facilities, as under the 2006 LRDP.

This alternative was rejected from further consideration because it 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.

V.C. No Project Alternative

V.C.1 Description

The No Project Alternative would result in development at the main LBNL site pursuant to the existing 1987 LRDP. 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 from existing conditions, to 4,750.[2] No increases in the parking supply would occur. Since the main hill site is generally built out pursuant to the 1987 LRDP, 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

[2] Total occupiable building space of approximately 2 million gsf used here for purposes of comparison; actual total permitted under the 1987 LRDP is 1,996,200 gsf, as indicated in Chapter III, Project Description.

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. The CRT Building would require project-specific environmental review prior to construction. Additionally, under the No Project Alternative, some of the roadway and parking improvements (but not an increase in parking spaces) and utility upgrades outlined in Chapter III, Project Description, would be constructed. This would be approved pursuant to the 1987 LRDP, subject to further environmental review if needed.

To accommodate future growth under the No Project Alternative, an increase in off-site leased space could occur. The Lab would not construct off-site space, but rather would lease and occupy either already-built facilities or new facilities that would have been constructed by others and approved by some other entity (e.g., a city or county) and would be subject to that entity's CEQA review. Off-site facilities would, in general, provide office or research and development space. Space for specialty research needs, including most of those involving hazardous materials or specialized facilities such as particle accelerators, would continue to be provided at the main hill site. While such off-site facilities have not been identified, it would be reasonable to assume that leased off-site space would be in proximity to the hill site and other existing leased space (e.g., Berkeley, Oakland, Walnut Creek). However, it is not possible to know with certainty where such facilities would be located or how large they might be.

V.C.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 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. The No Project Alternative would avoid the project's significant and unavoidable aesthetic, noise and traffic impacts.

The demolition of the Bevatron has been evaluated in a separate project-specific EIR. The demolition of the Bevatron is identified in that document as resulting in a significant and unavoidable impact to cultural resources. This impact would remain under the No Project Alternative, as it would not be a direct result of the 2006 LRDP and would occur regardless of whether the 2006 LRDP were adopted. Future building replacement at the hill site, while anticipated under the No Project Alternative, is not analyzed herein at a building-specific or

location-specific level, because it would be speculative to attempt to determine the nature and degree of potential impacts at this time. Additionally, future development at the hill site would undergo project-specific environmental review and would be subject to the existing 1987 LRDP.

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.

V.C.2.1 Aesthetics

The proposed project would result in significant, unavoidable aesthetic impacts. Under the No Project Alternative, it is assumed that the existing appearance of the hill site would generally remain unchanged, with the exception of the development of approved projects identified above. Because most of these buildings would be relatively unobtrusive in views from off-site, this alternative would have substantially lesser aesthetic impacts than those identified for the proposed project, and the aesthetic impacts of this alternative would be less than significant.

V.C.2.2 Air Quality

The proposed project would result in less-than-significant project-specific air quality impacts, with mitigation. Under the No Project Alternative, new development would not occur, with the exception of the development of approved projects identified above. Thus, this alternative would result in substantially lesser emissions of criteria air pollutants and toxic air contaminants than would the proposed project, and these impacts would be less than significant. However, while the No Project Alternative would result in a lesser contribution than would the project to the cumulative significant impact with regard to toxic air contaminant emissions, this contribution would still be considerable, and the cumulative impact would remain significant and unavoidable.

V.C.2.3 Biological Resources

With mitigation, the proposed project would result in less-than-significant impacts on biological resources. The No Project Alternative does not identify future development at the hill site, with the exception of the projects identified above. Therefore, this alternative would result in lesser impacts on biological resources than would the proposed project.

V.C.2.4 Cultural Resources

The proposed project would result in significant and unavoidable impacts to historical resources, primarily due to demolition of the Building 51 complex and the Bevatron (and, potentially, other resources determined to be historical). As this demolition would occur regardless of whether the 2006 LRDP were adopted and implemented, it is assumed to occur as part of the No Project Alternative, as well, and thus this impact would remain significant and unavoidable. The demolition of the Bevatron has been evaluated in a separate project-specific EIR; certification of that EIR is anticipated to be considered in early 2007. The demolition of the Bevatron is identified in that document as resulting in a significant and unavoidable impact on cultural resources. The No Project Alternative, however, would reduce the likelihood, compared to the

proposed project, that other buildings, as yet unrecognized as historical resources under CEQA, might be demolished. Thus, this alternative would result in lesser impacts overall to historic resources than would the 2006 LRDP, but the impact would continue to remain significant and unavoidable based on the demolition of the Building 51 complex and the Bevatron. Effects on archaeological resources would be less than significant with mitigation, as under the proposed project.

V.C.2.5 Geology and Soils

With mitigation, the proposed project would result in less-than-significant impacts with respect to geology and soils. Under the No Project Alternative, new development would not occur at the hill site, with the exception of the development of approved projects identified above. Therefore, this alternative would result in geology impacts that would be less substantial than the potential impacts identified under the proposed 2006 LRDP, and the impacts of this alternative would be less than significant with mitigation.

V.C.2.6 Hazards and Hazardous Materials

With mitigation, the proposed project would result in less-than-significant impacts with respect to hazards and hazardous materials. Under the No Project Alternative, new development would not occur at the hill site, with the exception of the development of approved projects identified above. Therefore, this alternative would result in hazards and hazardous materials impacts that would be less substantial than those of the proposed project, and the impacts of this alternative would be less than significant with mitigation.

V.C.2.7 Hydrology and Water Quality

The proposed project would result in less-than-significant impacts to hydrology and water quality. Under the No Project Alternative, no new development at the hill site would occur, with the exception of the development of approved projects identified above. Thus, this alternative would result in lesser hydrology and water quality impacts than the less-than-significant impacts identified under the proposed project, and the impacts of this alternative would be less than significant.

V.C.2.8 Land Use and Planning

The proposed project would result in less-than-significant land use impacts. Under the No Project Alternative, no new land uses would be introduced to the site and land use impacts would be lesser than the less-than-significant impacts of the proposed project. Land use impacts would be less than significant under the No Project Alternative.

V.C.2.9 Noise

With mitigation, the proposed project operations would result in less-than-significant noise impacts, but project construction activities would result in a significant and unavoidable noise

impact. The effects of the No Project Alternative with respect to noise from construction and demolition activity and traffic noise would be less substantial than the noise impacts of the proposed project, since substantially less demolition and construction activity would occur. Future redevelopment on the hill site would be subject to project-specific environmental review, most likely tiered from the 1987 LRDP EIR, as amended. Any future development would be subject to the goals, objectives and mitigation measures identified within the 1987 LRDP and 1987 LRDP EIR, as amended. Moreover, it is anticipated that the development under this alternative would be in locations relatively distant from existing neighborhoods. Thus, it is likely that the noise effects of this alternative would be less than significant.

V.C.2.10 Population and Housing

The proposed project would result in less-than-significant impacts with respect to population and housing. The No Project Alternative would minimally increase the ADP at the hill site, compared to existing conditions, and would result in correspondingly smaller changes in employment and housing demand, compared to those identified for the 2006 LRDP. Thus, effects of the No Project Alternative would be less substantial than the less-than-significant impacts of the proposed project, and the effects of the No Project Alternative would likewise be less than significant.

V.C.2.11 Public Services and Recreation

The proposed project would result in less-than-significant impacts with respect to public services and facilities. Under this alternative, no substantial change in the ADP at the hill site would occur; therefore, the demand for public services would not increase substantially and would be less than the anticipated demand under the proposed project. The effect on public services and facilities would be smaller than that of the proposed project and, like project impacts, the effects of this alternative on police, fire, schools, and parks would be less than significant.

V.C.2.12 Transportation/Traffic

The No Project Alternative would not include the increases in on-site parking that are part of the proposed project. As a result the significant and unavoidable traffic impacts (both project-specific and cumulative) that would result from the project at the intersections of Gayley Road/Stadium Rim Way, Durant Avenue/Piedmont Avenue, and Hearst/Gayley/La Loma would be avoided under this alternative. Other traffic impacts would also be less substantial than those of the proposed project. While future building replacement at the Lab could result in relatively minor traffic impacts during construction, no significant transportation impacts related to construction and demolition activity are anticipated, given the less-than-significant construction impacts of the proposed project. Therefore, transportation impacts of the No Project Alternative would be less substantial than those of the proposed project, and would be less than significant, with mitigation.

V.C.2.13 Utilities, Service Systems, and Energy

With mitigation, the proposed project would result in less-than-significant impacts with respect to utilities, service systems and energy. Under the No Project Alternative, the demand for utilities

(e.g., water and electricity use, wastewater generation, solid waste generation), service systems, and energy would be incrementally higher than existing conditions, as development on the site under the existing LRDP allows for minimal increases in the ADP and occupiable building space. Solid waste generation from construction and demolition activity would be less than the project's less-than-significant effects because substantially fewer on-site development projects would be proposed. Thus, effects would be less substantial than those of the proposed project.

V.D. Reduced Growth 1 Alternative

V.D.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. At the 2025 planning horizon for the Reduced Growth 1 Alternative, which would be the same horizon as for the 2006 LRDP, this alternative could result in 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 (see Table V-1). 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 the Reduced Growth 1 Alternative, future demand for any additional building space would be accommodated at off-site locations. As under the No Project Alternative, it is anticipated that the Lab would lease and occupy either already-built facilities or new facilities that would have been approved by some other entity and subject to that entity's CEQA review. Additionally, off-site leased space would, in general, likely be located in proximity to existing space occupied by LBNL (e.g., Berkeley, Oakland, Walnut Creek). However, it is not possible to know with certainty where such facilities would be located or how large they might be.

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.

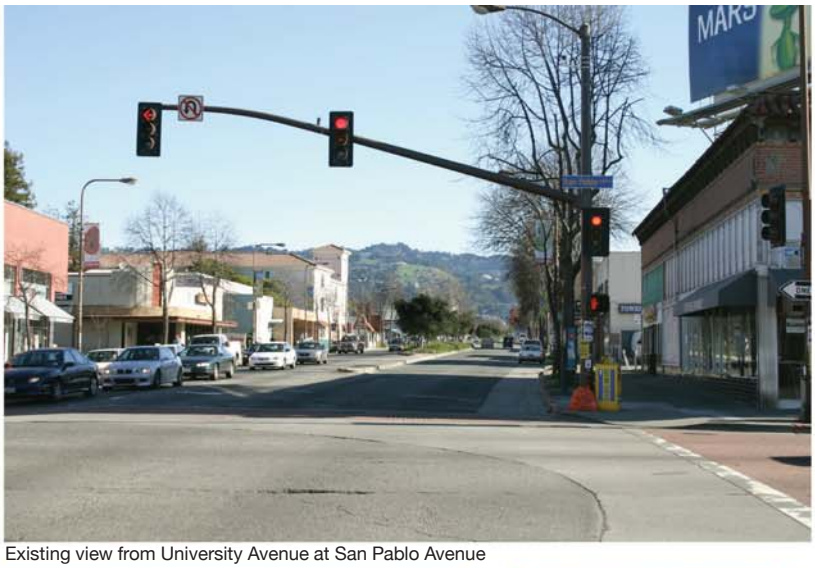
V.D.2 Impacts

V.D.2.1 Aesthetics

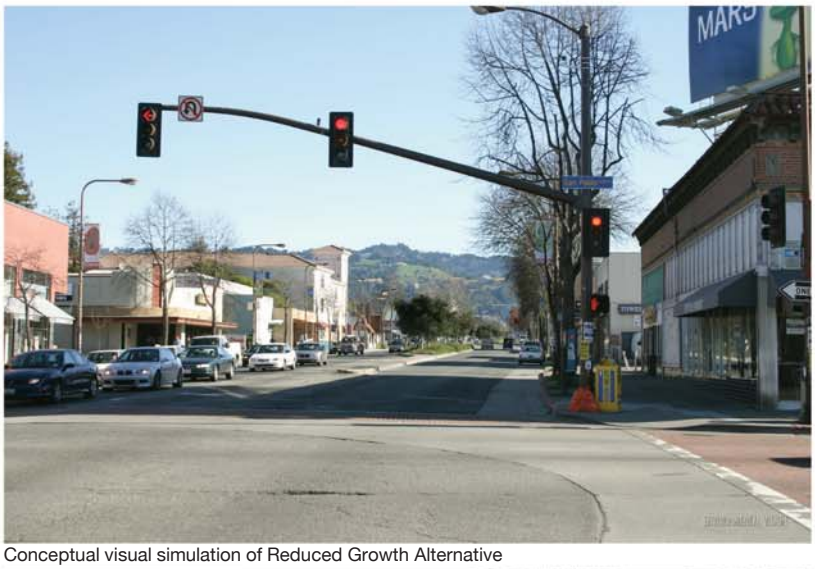
The Reduced Growth 1 Alternative would result in a smaller amount of development on the hill site than the proposed project. Thus, the number of new structures would be less than under the proposed project, as would the potential for changes in the visual environment. Similar to the proposed project, development under this alternative would be subject to the guidance within the 2006 LRDP as well as the mitigation measure related to potential light and glare impacts. This alternative would reduce the overall building square footage, as well as possibly some specific building height and mass, thereby reducing the potential for visual changes to the LBNL site. Figures V-1 through V-3 illustrate potential height and massing that could be developed under the Reduced Growth 1 Alternative from representative public vantage points. The comparison of these representative buildings to those included in Section IV.A, Aesthetics and Visual Quality, illustrates lower building heights and thus, less intrusion of new buildings into the unbuilt areas on the LBNL site (see Figures V-1a and V-2a compared to Figures V-1b and V-2b; the latter are reprinted from Section IV.A). Visual changes under this alternative would be lessened when compared to the project. As stated in Section IV.A, implementation of the proposed 2006 LRDP would alter views of the LBNL site from nearby areas, including the Lawrence Hall of Science and residential neighborhoods and commercial areas in the cities of Berkeley and Oakland. In general, views of the Lab hill site would be incrementally intensified because additional buildings would be visible, although no buildings would be constructed of a height and/or without sufficient screening such that they would dramatically stand out from existing Lab development in long-range views of the hillside. While some observers would not consider the changes in the existing visual setting to be substantial, visual quality is subjective, and different observers may have different reactions to changes in long-range views of the Lab's hill site, with some people likely to find the increase in building density, even though partially screened, to be disruptive or even offensive. Therefore, for purposes of a conservative analysis, this EIR concludes that the proposed LRDP, as described by the Illustrative Development Scenario shown in the visual simulations, would potentially have a substantial adverse effect on scenic vistas, and might be found by some observers to substantially damage scenic resources. While the lesser building heights under Reduced Growth 1 Alternative would further reduce visibility of development from off-site locations, compared to conditions with the project, some changes would remain readily apparent and could be considered disruptive. Therefore, visual impacts, while less substantial than under the project, would remain significant and unavoidable with implementation of this alternative. As with the project, light and glare impacts would be less than significant with mitigation and construction-period and cumulative impacts would be less than significant.

V.D.2.2 Air Quality

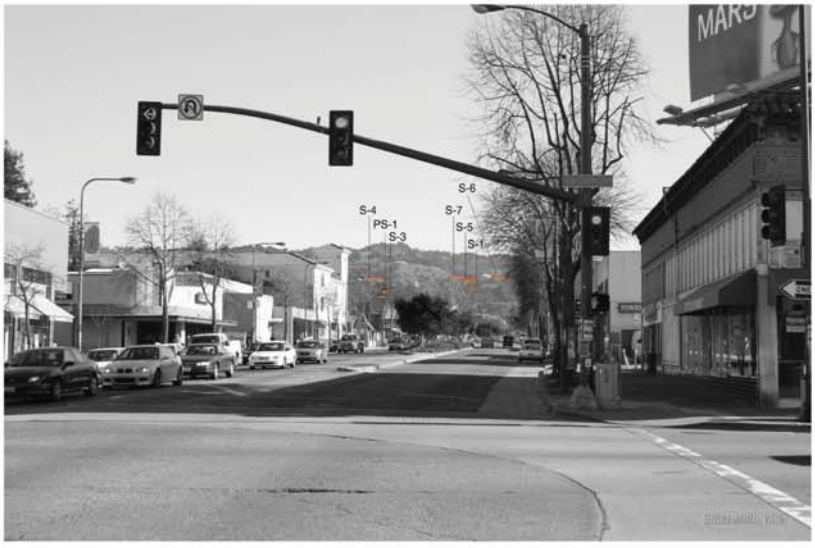
The Reduced Growth 1 Alternative would result in impacts similar to, but reduced in magnitude from, those of the proposed project. Mitigation measures adopted as part of the proposed project to reduce potentially significant air quality construction impacts to less–than-significant levels would also apply under this alternative. The Reduced Growth 1 Alternative would result in less development on the hill site and result in a decrease in operational emissions of criteria pollutants



Existing view from University Avenue at San Pablo Avenue



Conceptual visual simulation of Reduced Growth Alternative

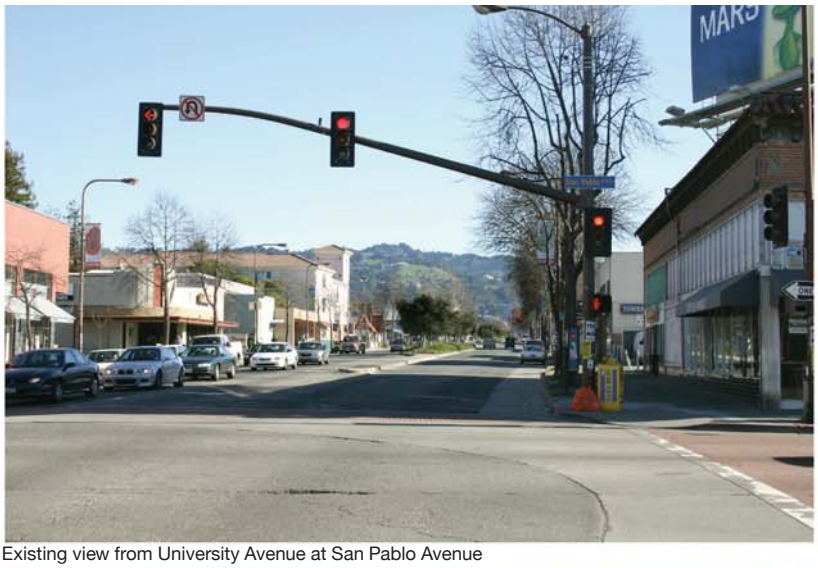


View Diagram of Reduced Growth Alternative

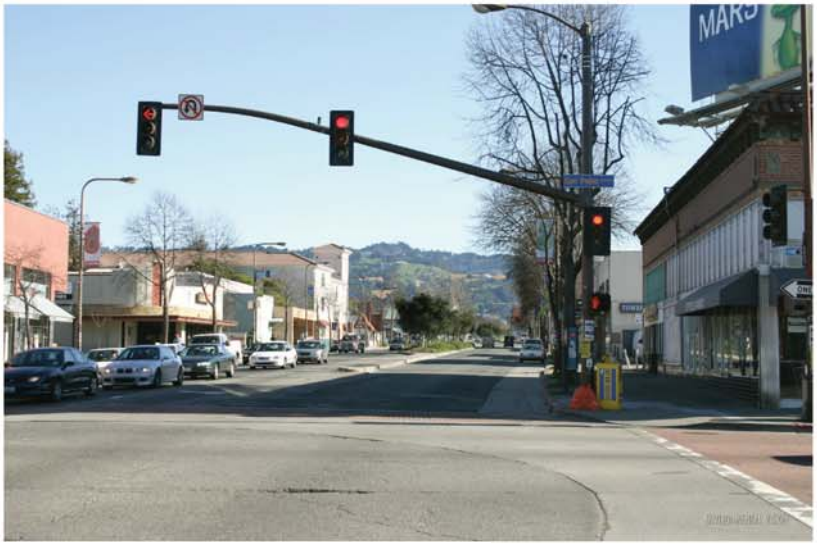
SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure V-1a
Alternative Site Photo and Simulation



Existing view from University Avenue at San Pablo Avenue



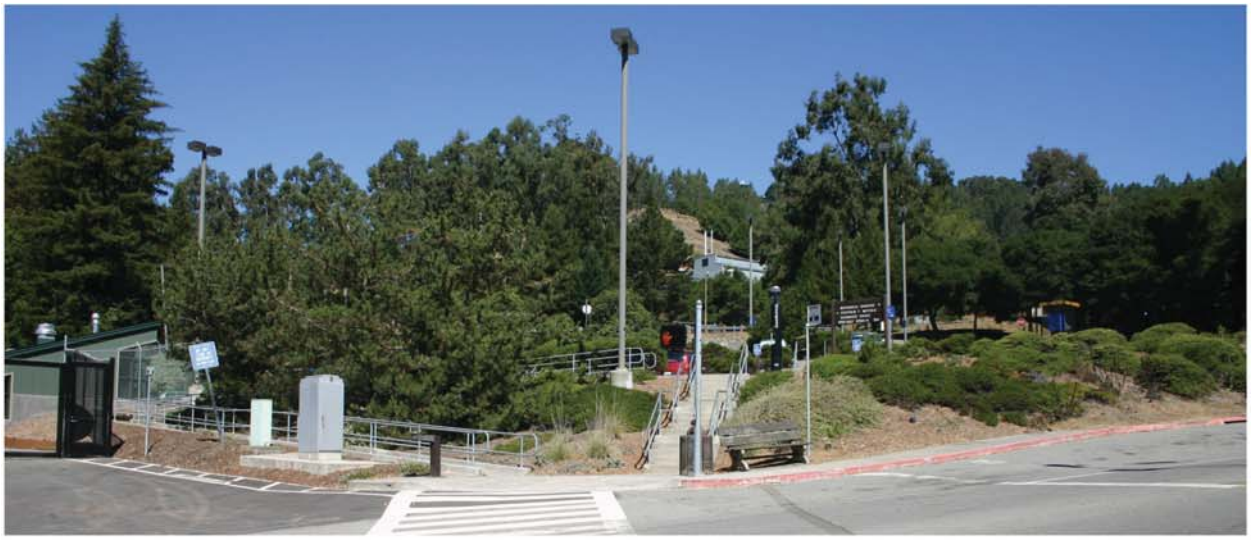
Conceptual visual simulation of Proposed Project

View Diagram of Proposed Project

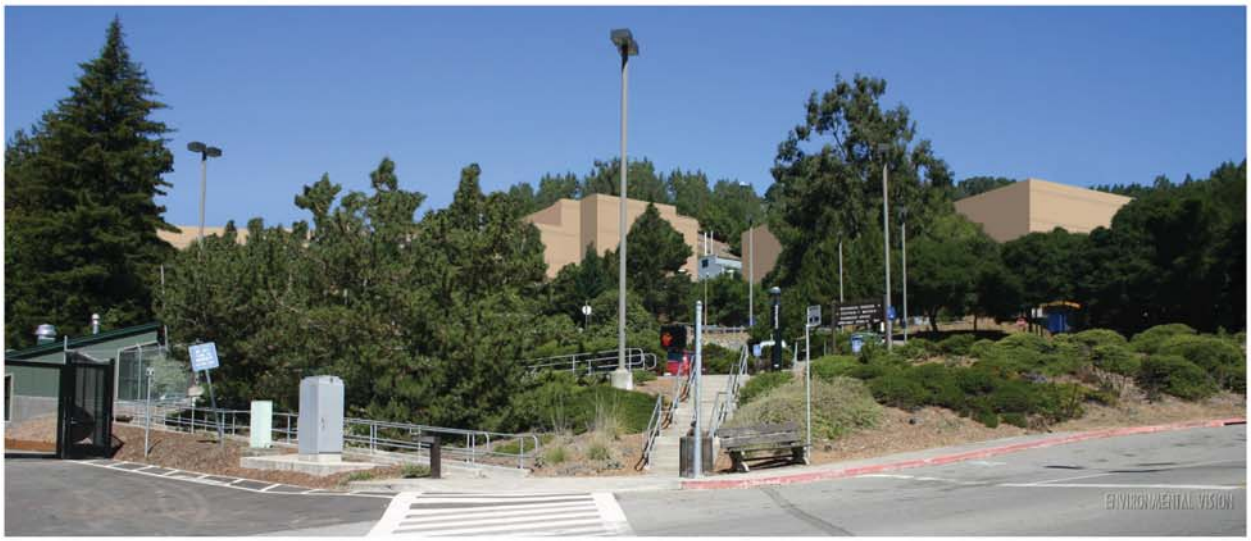
SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure V-1b
Site Photo and Simulation



Existing view from Centenial Drive crosswalk at Botanical Garden



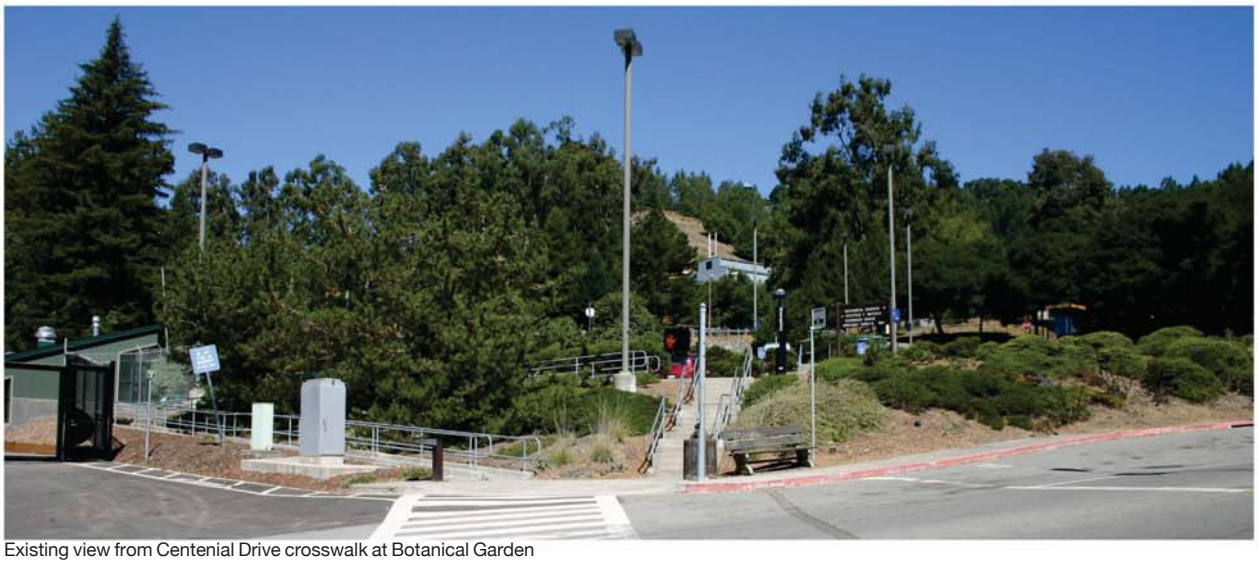
Conceptual visual simulation of Reduced Growth Alternative

View Diagram of Reduced Growth Alternative

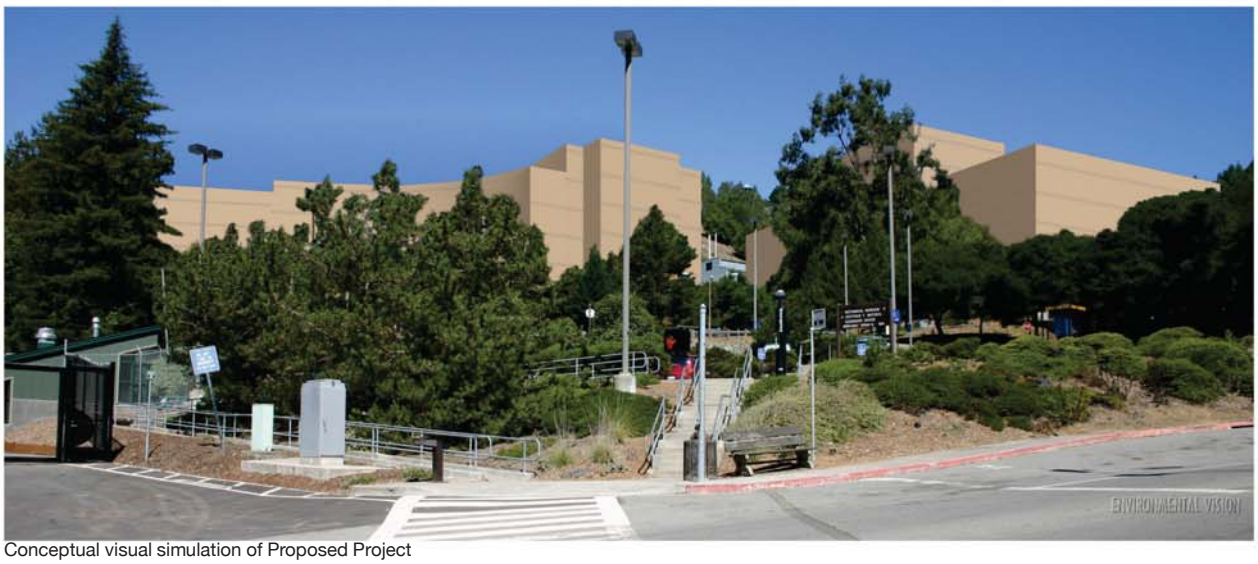
SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

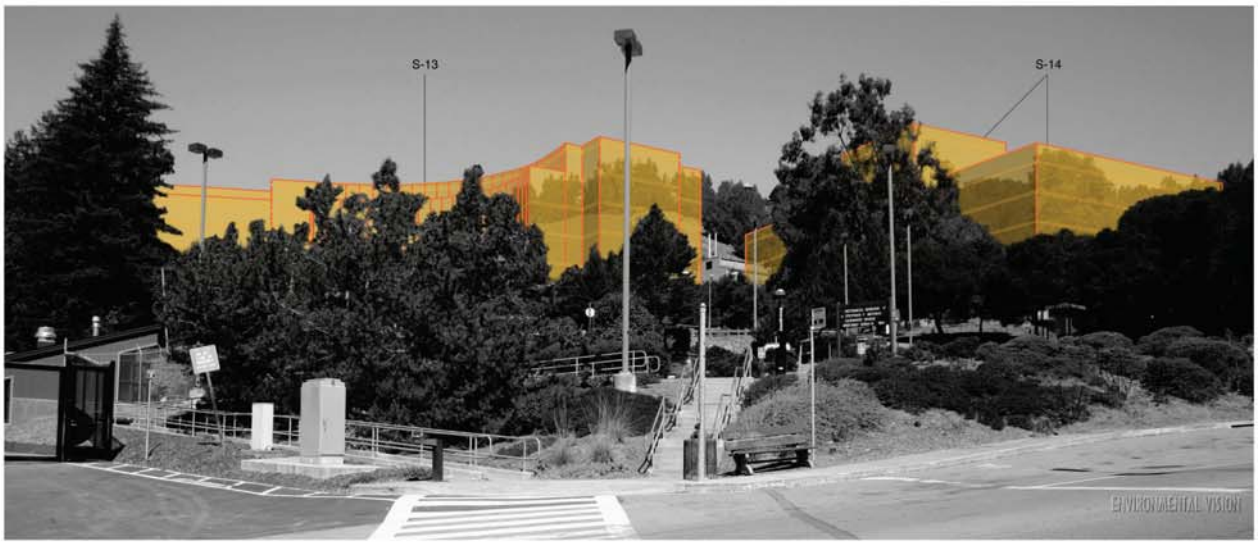
Figure V-2a
Alternative Site Photo and Simulation



Existing view from Centenial Drive crosswalk at Botanical Garden



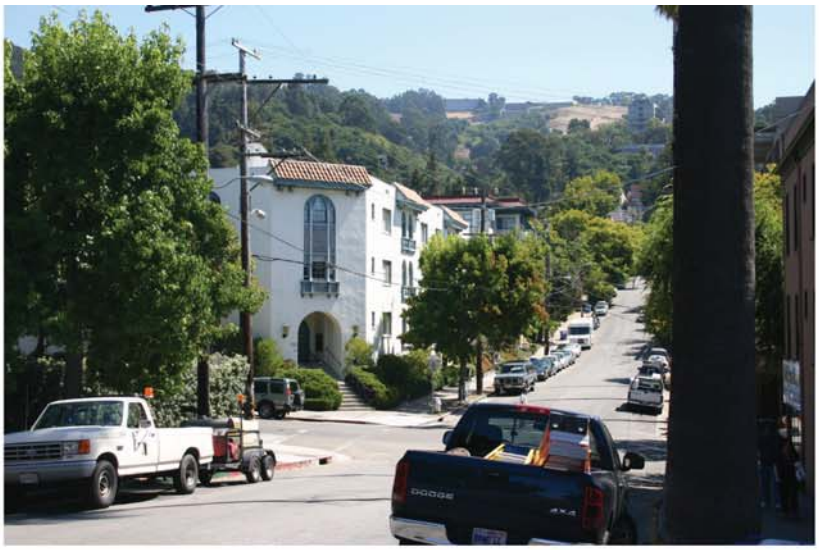
Conceptual visual simulation of Proposed Project



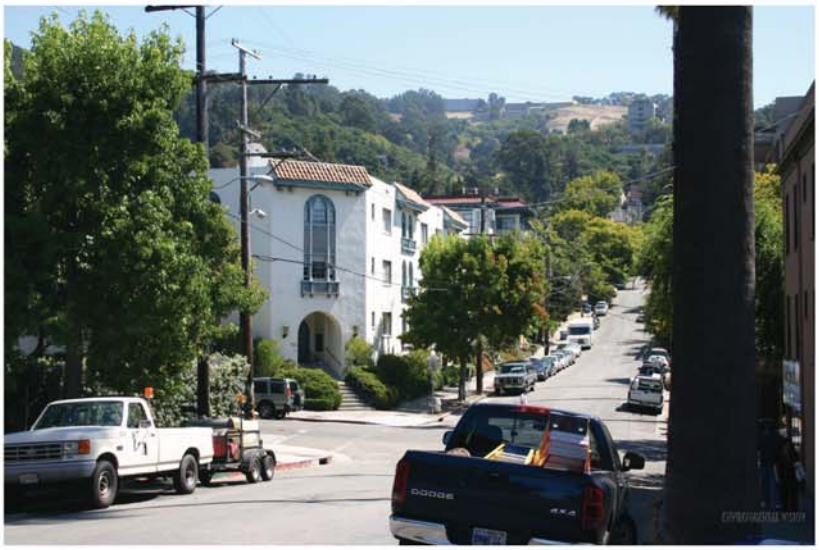
View Diagram of Proposed Project

SOURCE: Environmental Vision

Figure V-2b
Site Photo and Simulation



Existing view from Ridge Road at Euclid Avenue



Conceptual visual simulation of Reduced Growth Alternative

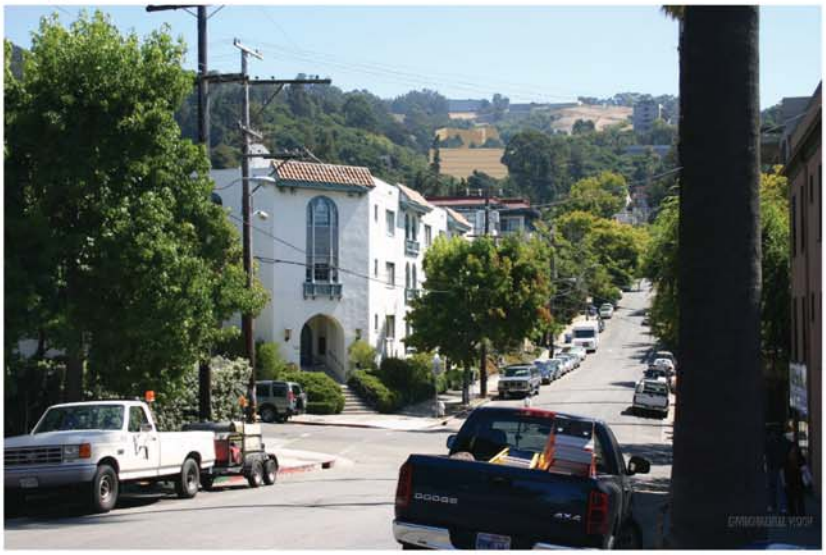
View Diagram of Reduced Growth Alternative

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure V-3a
Alternative Site Photo and Simulation

Existing view from Ridge Road at Euclid Avenue



Conceptual visual simulation of Proposed Project

View Diagram of Proposed Project

SOURCE: Environmental Vision

LBNL 2006 Long Range Development Plan . 201074

Figure V-3b
Site Photo and Simulation

and toxic air contaminants compared to the proposed project. Therefore, this alternative would result in proportionately smaller operational air quality impacts than the less-than-significant effects of the proposed project, and effects of this alternative would also be less than significant. As with the project, the Reduced Growth 1 Alternative would result in a cumulative significant impact with regard to toxic air contaminant emissions, although the contribution of this alternative would somewhat less than that of the project.

V.D.2.3 Biological Resources

The potential biological resources impacts under the Reduced Growth 1 Alternative would be similar to those described for the proposed project. However, since this alternative would result in less development on the hill site, the potential for construction and demolition activities to adversely affect on-site biological resources would be lower. Mitigation measures applicable to the proposed project would apply to this alternative, and, as with the proposed project, would reduce impacts of this alternative to less-than-significant levels.

V.D.2.4 Cultural Resources

The Reduced Growth 1 Alternative would result in cultural resources impacts similar to those of the proposed project. The significant and unavoidable impact under the proposed project related to demolition and construction activities that could affect as-yet unidentified historical resources would remain under this alternative. The significant and unavoidable impact associated with the demolition of the Bevatron, and addressed in a separate project-specific EIR, would also remain under this alternative. Under this alternative, impacts to archaeological resources and the potential to disturb human remains would be reduced to less-than-significant levels with mitigation measures identified for the proposed project and would be less substantial than those of the project, since this alternative would result in less new development at the hill site.

V.D.2.5 Geology and Soils

Geology and soils impacts under the Reduced Growth 1 Alternative would generally be the same as described for the proposed project. However, since this alternative would result in less development on the hill site, and therefore a lower ADP, the exposure to geologic and seismic hazards would be somewhat reduced. Mitigation measures applicable to the proposed project would apply to this alternative, and the impacts of the Reduced Growth 1 Alternative would be somewhat less substantial than impacts of the proposed project. Impacts of this alternative would be less than significant with mitigation.

V.D.2.6 Hazards and Hazardous Materials

The potential hazards and hazardous materials impacts under the Reduced Growth 1 Alternative would generally be the same as described for the proposed project. However, since this alternative would result in less development on the hill site, impacts associated with hazards and hazardous materials would be incrementally less. Mitigation measures applicable to the proposed project would apply to this alternative. Impacts of this alternative would be less than significant with mitigation.

V.D.2.7 Hydrology and Water Quality

The potential hydrology and water quality impacts under the Reduced Growth 1 Alternative would generally be the same as those described for the proposed project. However, since this alternative would result in less development on the hill site, hydrologic and water quality impacts would be incrementally less than the less-than-significant impacts of the proposed project. Impacts of this alternative would be less than significant.

V.D.2.8 Land Use and Planning

The Reduced Growth 1 Alternative land use impacts, in general, would be the same as described for the proposed project since this alternative would result in a similar mix of land use on the hill site. As with the proposed project, land use impacts would be less than significant.

V.D.2.9 Noise

The Reduced Growth 1 Alternative would result in construction noise impacts similar to those of the proposed project, but less in overall duration due to the lesser amount of construction that would occur under this alternative. Mitigation measures adopted as part of the proposed project would also apply to this alternative. As with the proposed project, individual construction and/or demolition projects undertaken under the Reduced Growth 1 Alternative could result in noise impacts that could not be fully mitigated. The Reduced Growth 1 Alternative would result in less development on the hill site compared to the proposed project, and thus a proportionately smaller increase in the ambient noise level due to operational noise. Significant and unavoidable impacts associated with construction noise would be proportionately lower since less development would occur, but would be significant and unavoidable under this alternative.

V.D.2.10 Population and Housing

The Reduced Growth 1 Alternative would result in less development on the hill site and roughly three-quarters of the new ADP of the proposed project. Thus, impacts attributable to increased population and housing demand would be smaller than the less-than-significant impacts of the proposed project, and would also be less than significant.

V.D.2.11 Public Services and Recreation

The new ADP on the hill site under the Reduced Growth 1 Alternative would be roughly three-quarters of the new ADP under the proposed project. Thus, the demand for fire services, police services, schools, and parks and recreation would be proportionately lower. Impacts to public services under this alternative would be lesser than the less-than-significant impacts of the proposed project, and would likewise be less than significant.

V.D.2.12 Transportation/Traffic

The Reduced Growth 1 Alternative would result in less development and 75 percent of the net new parking spaces on the hill site compared to the proposed LRDP project. Under this

alternative, the ADP would increase by about 760, or about 76 percent of the new ADP proposed under the 2006 LRDP. Since this alternative would provide fewer on-site parking spaces, compared to the proposed project, it would result in correspondingly lower traffic volumes; the alternative would therefore have a less-than-significant impact on the intersection of Hearst Avenue at Gayley Road/La Loma Avenue, rather than the significant and unavoidable impact that the 2006 LRDP project would have. That change in impact determination is because, while the level of service (LOS) would be unchanged, the increase in traffic volume due to this alternative would be less than the five-percent threshold of significance for intersections already operating at LOS E or LOS F when no change in LOS occurs with the addition of project traffic. (See Section IV.L, Transportation/Traffic, for a further discussion of this five-percent threshold.) As with the proposed project, the installation of traffic signals at two other intersections (Gayley Road/Stadium Rim Way and Durant Avenue/Piedmont Avenue) would be necessary to mitigate the alternative's significant impacts, and mitigation measures identified for the project (installation of traffic signals) would be required to reduce these impacts to less-than-significant levels. Also as with the project, because LBNL could not implement these measures on its own, the impact at these intersections would be considered significant and unavoidable. Compared to the proposed project, this alternative would result in incrementally lesser transit impacts, while pedestrian, bicycle, and parking impacts would be similar; these impacts would all be less than significant. As already noted, because LBNL could not implement intersection operation mitigations, the impact at the two intersections noted above would be considered significant and unavoidable.

V.D.2.13 Utilities, Service Systems, and Energy

The proposed occupiable building space and ADP on the hill site under the Reduced Growth 1 Alternative would be lower than under the proposed project. Thus, the demand for water, electricity, natural gas and the generation of wastewater, stormwater, and solid waste associated with the increased development intensity would be proportionately lower on the hill site. Mitigation measures applicable to the proposed project to reduce potential impacts to less-than-significant levels would also apply to this alternative. Impacts to utilities, service systems and energy under this alternative would generally be less substantial than the impacts of the proposed project.

V.E. Reduced Growth 2 Alternative

V.E.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. The Reduced Growth 2 Alternative proposes a development intensity at the main hill site that is greater, however, than the ADP and occupiable building space proposed under Reduced Growth 1 Alternative. The Reduced Growth 2 Alternative would provide somewhat less net new occupiable building space than that currently proposed pursuant to the 2006 LRDP including the reduction in

the scope of the LRDP that was made in response to comments from the City of Berkeley, but incrementally more ADP (see Table V-1). At the 2025 planning horizon, 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.

Additional demand for building space beyond that provided under this alternative would be expected to be relatively low since much of the growth proposed under the LRDP would be accommodated under this alternative. Should demand for additional off-site space be necessary, it would be leased at off-site locations. Off-site locations would include either already-built facilities or new facilities approved by some other entity and subject to that entity's CEQA review. In general, it would be expected that off-site leased space would be located in proximity to existing occupied spaces (e.g., Berkeley, Oakland, Walnut Creek). However, it is not possible to know with certainty where such facilities would be located or how large they might be.

V.E.2 Impacts

V.E.2.1 Aesthetics

The Reduced Growth 2 Alternative prescribes less net new occupiable building space on the hill site compared to the 2006 LRDP, and therefore would result in fewer visual changes. Similar to the proposed project, development under this alternative would be subject to the mitigation measure related to potential light and glare impacts. This alternative would reduce the overall building square footage, as well as specific building height and mass, although it would not reduce the overall building square footage by as much as the Reduced Growth 1 Alternative, and it would result in a slightly increased ADP. As stated in Section IV.A, implementation of the proposed 2006 LRDP would alter views of the LBNL site from nearby areas, including the Lawrence Hall of Science and residential neighborhoods and commercial areas in the cities of Berkeley and Oakland. In general, views of the Lab hill site would be incrementally intensified because additional buildings would be visible, although no buildings would be constructed of a height and/or without sufficient screening such that they would dramatically stand out from existing Lab development in long-range views of the hillside. While some observers would not consider the changes in the existing visual setting to be substantial, visual quality is subjective, and different observers may have different reactions to changes in long-range views of the Lab's hill site, with some people likely to find the increase in building density, even though partially screened, to be disruptive or even offensive. Therefore, for purposes of a conservative analysis, this EIR concludes that the proposed LRDP, as described by the Illustrative Development Scenario shown in the visual simulations, would potentially have a substantial adverse effect on

scenic vistas, and might be found by some observers to substantially damage scenic resources. Because the Reduced Growth 2 Alternative would be comparable in intensity of development to the project, visual impacts would also be comparable, and would be significant and unavoidable with implementation of this alternative, as with the project. Also as with the project, light and glare impacts would be less than significant with mitigation and construction-period and cumulative impacts would be less than significant.

V.E.2.2 Air Quality

The Reduced Growth 2 Alternative proposes less occupiable building space on the hill site and fewer parking places (and thus auto traffic to and from the hill site) than the 2006 LRDP as currently proposed, and would result in proportionately lesser potential air quality impacts. Mitigation measures to address air quality construction impacts under the proposed project would apply under this alternative, and implementation of such measures would reduce potential impacts to less-than-significant levels. Operational emissions of criteria pollutants and toxic air contaminants would also be reduced under this alternative due to less development and fewer vehicles at the hill site. Therefore, this alternative would result in proportionately smaller operational air quality impacts than the less-than-significant effects of the proposed project, and effects of this alternative would also be less than significant. As with the project, the Reduced Growth 2 Alternative would result in a cumulative significant impact with regard to toxic air contaminant emissions, although the contribution of this alternative would somewhat less than that of the project.

V.E.2.3 Biological Resources

Biological resources impacts under the Reduced Growth 2 Alternative would be similar to those described for the proposed project, since this alternative would result in a comparable level of development on the hill site. Mitigation measures applicable to the proposed project would also apply to the Reduced Growth 2 Alternative.

V.E.2.4 Cultural Resources

The Reduced Growth 2 Alternative would result in cultural resources impacts similar to those of the proposed project. Significant and unavoidable impacts under the proposed project related to demolition and construction activities that could affect as-yet unidentified historical resources, and the demolition of the Bevatron (addressed in a separate project-specific EIR), would remain under this alternative. Mitigation measures applicable to the proposed project to reduce potential impacts to archaeological resources and the potential to disturb human remains would also apply to this alternative. Archaeological impacts of this alternative would also be similar to those of the project, given the comparable level of ground-disturbing activities anticipated.

V.E.2.5 Geology and Soils

Geology and soils impacts under the Reduced Growth 2 Alternative would generally be the same as described for the proposed project, since the amount of net new occupiable building space

under this alternative would be only slightly lower than under the LRDP and the new ADP would be slightly higher. Mitigation measures applicable to the proposed project would also apply to this alternative, and the impacts of the Reduced Growth 2 Alternative would be less than significant with mitigation.

V.E.2.6 Hazards and Hazardous Materials

The Reduced Growth 2 Alternative would result in slightly less net new occupiable building space and slightly more new ADP on the hill site compared to the proposed project. Thus, impacts associated with hazards and hazardous materials would be generally about the same as those of the project. Mitigation measures applicable to the proposed project would also apply to this alternative, and would reduce impacts to less-than-significant levels.

V.E.2.7 Hydrology and Water Quality

The potential hydrology and water quality impacts under the Reduced Growth 2 Alternative, in general, would be the same as those described for the proposed project. However, because this alternative proposes slightly less development on the hill site, hydrologic and water quality impacts would be incrementally less. The impacts of the Reduced Growth 2 Alternative would be incrementally less than the less-than-significant impacts of the proposed project.

V.E.2.8 Land Use and Planning

The Reduced Growth 2 Alternative proposes a similar mix of land uses as under the LRDP, though with slightly less net new occupiable building space and slightly higher ADP. Therefore, land use impacts would generally be the same as described for the proposed project, and, as with the proposed project, land use impacts would be less than significant.

V.E.2.9 Noise

Although the Reduced Growth 2 Alternative proposes slightly less net new occupiable building space at the hill site compared to the proposed project, noise impacts during construction under this alternative would be similar to those of the project, as would the increase in ambient noise level following construction completion, since the difference in development proposed is relatively small. Mitigation measures adopted as part of the proposed project would also apply to this alternative and the incorporation of such measures would reduce potentially significant noise impacts to less-than-significant levels. However, as with the proposed project, individual construction and/or demolition projects undertaken under the Reduced Growth 2 Alternative could result in noise impacts that could not be fully mitigated, and therefore construction noise impacts would be significant and unavoidable under this alternative.

V.E.2.10 Population and Housing

The Reduced Growth 2 Alternative would result in less occupiable building space on the hill site and about 2.5 percent more growth in the ADP than proposed under the LRDP (although 11

percent less ADP growth than proposed in the original LRDP identified in the Notice of Preparation). Because the ADP at the planning horizon would be only slightly higher than that now proposed under the LRDP, impacts attributable to increases in population and housing demand would likely be comparable to the proposed project under this alternative, and would also be less than significant.

V.E.2.11 Public Services and Recreation

The Reduced Growth 2 Alternative would result in slightly higher ADP than proposed under the LRDP. Thus, the demand for fire services, police services, schools, and parks and recreation would also be slightly higher. Impacts to public services under this alternative would be similar to the less-than-significant impacts of the proposed project, and would likewise be less than significant.

V.E.2.12 Transportation/Traffic

The Reduced Growth 2 Alternative would result in 75 percent of the number of parking spaces on the hill site compared to development under the proposed 2006 LRDP. Under this alternative, the ADP would increase by about 1,025 or about 102.5 percent of the ADP increase proposed under the 2006 LRDP. Under this alternative, the use of transit and LBNL shuttles would increase to a higher level than with the proposed project. However, since this alternative would provide fewer on-site parking spaces, compared to the proposed project, it would result in correspondingly lower traffic volumes; the alternative would therefore have a less-than-significant impact on the intersection of Hearst Avenue and Gayley Road/La Loma Avenue, rather than the significant and unavoidable impact that the 2006 LRDP project would have. That change in impact determination is because, while the LOS would be unchanged, the increase in traffic volume due to this alternative would be less than the five-percent threshold of significance for intersections already operating at LOS E or LOS F when no change in LOS occurs with the addition of project traffic. Project mitigation measures to address significant impacts to transit service would also apply to this alternative, and the implementation of such measures would reduce significant impacts to less-than-significant levels. Similar to the proposed project, the installation of traffic signals at two intersections (Gayley Road/Stadium Rim Way and Durant Avenue/Piedmont Avenue) would be necessary to mitigate significant impacts and because LBNL could not implement these measures on its own, the impact at these intersections would be considered significant and unavoidable. Compared to the proposed project, this alternative would result in proportionately greater transit impacts, since less parking would be provided on-site, although these impacts would be less than significant with project mitigation measures. Because LBNL could not implement intersection operation mitigations, the impact at the two intersections noted above would be considered significant and unavoidable.

V.E.2.13 Utilities, Service Systems, and Energy

The Reduced Growth 2 Alternative, at the planning horizon, would result in slightly more ADP but less occupiable building space compared to the 2006 LRDP. The demand for utilities, service systems, and energy is generally related to on-site population and building space; therefore, under

this alternative the potential impacts to utilities, service systems, and energy would be expected to be greater than under the Reduced Growth 1 Alternative, and slightly lower than the impacts of the proposed project. Mitigation measures applicable to the proposed project to reduce potential impacts to less-than-significant levels would apply to this alternative.

V.F. Preservation Alternative with Non-LBNL Use of Historical Resources

V.F.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 (LBNL, 2005), 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.[3]

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.

V.F.2 Impacts

Other than retention and possible rehabilitation and reuse of certain historic structures, this alternative is assumed to include the same development program as the proposed 2006 LRDP; that is, an increase in LBNL Adjusted Daily Population (ADP) from 4,375 to 5,375 and an increase in building square footage of approximately 660,000 gross square feet (gsf) on the main hill site. Therefore, other than avoiding impacts to historical resources, this alternative would have essentially the same impacts as would the proposed project (the 2006 LRDP), because growth in both ADP and building area would be the same as with the project. This would be particularly true for impacts related to the intensity of development (i.e., traffic and other transportation-related impacts, air quality and noise resulting from operations, use of hazardous materials and generation of hazardous waste, population and housing demand, and demand for public services and utilities). While preservation of certain historic buildings could result in

[3] The Standards for Preservation define Preservation as "the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property." The focus is on "ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction," and exterior additions are generally not undertaken.

incremental changes in so-called "footprint" impacts (i.e., effects on views and other aesthetic impacts, effects on biological resources, the increase in impervious surface and resulting increase in stormwater runoff, siting of buildings relative to unstable soils and earthquake faults, and construction noise impacts on nearby sensitive receptors), the changes with this alternative would likely be imperceptible, compared to impacts of the proposed 2006 LRDP, because most buildings at the Lab are not National Register-eligible, and therefore most of the LBNL hill site would be treated in the same manner under this alternative as under the proposed 2006 LRDP.

V.F.2.1 Aesthetics

As stated in Section IV.A, implementation of the proposed 2006 LRDP would alter views of the LBNL site from nearby areas, including the Lawrence Hall of Science and residential neighborhoods and commercial areas in the cities of Berkeley and Oakland. In general, views of the Lab hill site would be incrementally intensified because additional buildings would be visible, although no buildings would be constructed of a height and/or without sufficient screening such that they would dramatically stand out from existing Lab development in long-range views of the hillside. While some observers would not consider the changes in the existing visual setting to be substantial, visual quality is subjective, and different observers may have different reactions to changes in long-range views of the Lab's hill site, with some people likely to find the increase in building density, even though partially screened, to be disruptive or even offensive. Therefore, for purposes of a conservative analysis, this EIR concludes that the proposed LRDP, as described by the Illustrative Development Scenario shown in the visual simulations, would potentially have a substantial adverse effect on scenic vistas, and might be found by some observers to substantially damage scenic resources. Although this alternative could result in incrementally diminished aesthetic effects at the sites of specific historical resources, overall visual impacts would be comparable to those of the project, and would be significant and unavoidable with implementation of this alternative, as with the project. Also as with the project, light and glare impacts would be less than significant with mitigation and construction-period and cumulative impacts would be less than significant.

V.F.2.2 Air Quality

The Non-LBNL Use Preservation Alternative would result in impacts similar to those of the proposed project. Mitigation measures adopted as part of the proposed project to reduce potentially significant air quality construction impacts to less-than-significant levels would also apply under this alternative. Operational emissions would be less than significant, as with the proposed project. Also as with the project, this alternative would result in a cumulative significant impact with regard to toxic air contaminant emissions.

V.F.2.3 Biological Resources

The potential biological resources impacts under the Non-LBNL Use Preservation Alternative would be essentially the same as those described for the proposed project. Mitigation measures applicable to the proposed project would apply to this alternative, and, as with the proposed project, would reduce impacts of this alternative to less-than-significant levels.

V.F.2.4 Cultural Resources

The Non-LBNL Use Preservation Alternative would avoid the proposed LRDP's significant and unmitigable cultural resources impacts by ensuring that existing and yet-to-be designated historical resources that would otherwise be proposed for demolition would be retained and preserved in accordance with the Secretary of the Interior's Standards. Under this alternative, impacts to archaeological resources and the potential to disturb human remains would be reduced to less-than-significant levels with mitigation measures identified for the proposed project.

V.F.2.5 Geology and Soils

Geology and soils impacts under the Non-LBNL Use Preservation Alternative would generally be the same as described for the proposed project, and would be less than significant with implementation of mitigation measures applicable to the proposed project, as these measures would also apply to this alternative.

V.F.2.6 Hazards and Hazardous Materials

The potential hazards and hazardous materials impacts under the Non-LBNL Use Preservation Alternative would generally be the same as described for the proposed project, and would be less than significant with implementation of mitigation measures applicable to the proposed project, as these measures would also apply to this alternative.

V.F.2.7 Hydrology and Water Quality

The potential hydrology and water quality impacts under the Non-LBNL Use Preservation Alternative would generally be the same as described for the proposed project, and would be less than significant, as with the project.

V.F.2.8 Land Use and Planning

Land use impacts under this alternative would be the same as described for the proposed project, and would be less than significant, as with the proposed project.

V.F.2.9 Noise

The Non-LBNL Use Preservation Alternative would result in construction noise impacts similar to those of the proposed project. Mitigation measures identified for the proposed project would also apply to this alternative. As with the proposed project, individual construction and/or demolition projects undertaken under this alternative could result in noise impacts that could not be fully mitigated. Operational noise impacts would be less than significant, as with the project.

V.F.2.10 Population and Housing

The Non-LBNL Use Preservation Alternative would result in the same less-than-significant population and housing impacts as those of the project.

V.F.2.11 Public Services and Recreation

The ADP on the hill site under the Non-LBNL Use Preservation Alternative would be the same as that under the proposed project, and thus the demand for fire services, police services, schools, and parks and recreation would be essentially the same, and impacts to public services would be essentially the same as the less-than-significant impacts of the proposed project.

V.F.2.12 Transportation/Traffic

The Non-LBNL Use Preservation Alternative would result in the same amount of development and parking spaces on the hill site compared to the proposed LRDP project, and therefore traffic, parking, pedestrian, bicycle, and transit impacts would be the same as those identified for the project. Like the project, this alternative would result in significant unmitigable project (and cumulative) impacts at three intersections: Hearst Avenue at Gayley Road/La Loma Avenue, Gayley Road/Stadium Rim Way, and Durant Avenue/Piedmont Avenue. (Mitigation identified for the latter two intersections under the project would apply under this alternative, but could not be implemented by the Lab on its own.) Other transportation impacts would be less than significant, with mitigation where identified for the project.

V.F.2.13 Utilities, Service Systems, and Energy

The ADP on the hill site under the Non-LBNL Use Preservation Alternative would be the same as that under the proposed project. Therefore, the demand for utilities, service systems, and energy would be essentially the same, and impacts would be essentially the same as the impacts of the proposed project. Mitigation measures applicable to the proposed project to reduce potential impacts to less-than-significant levels would apply to this alternative.

V.G. Off-Site Alternative

V.G.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 is currently owned by The UC Regents. It 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.

V.G.2 Impacts

Environmental effects at the hill site under the Off-Site Alternative, as compared to the 2006 LRDP, would be the same as those discussed under the Reduced Growth 1 Alternative since the ADP, occupiable building space (including demolition and new construction activities), and parking facilities under this alternative would be identical.

V.G.2.1 Aesthetics

The Off-Site Alternative would result in new development at the RFS to accommodate a portion of the Lab's projected growth. At the RFS site, aesthetic impacts would not be expected to be significant. Due to regulatory restrictions and the continued use of parts of the RFS site for research, construction of new buildings at the RFS site would likely occur outside of areas where sensitive biological and wetland resources are present. This requirement would likewise help to avoid aesthetic impacts by locating a development away from the shoreline. Also, the RFS site is generally zoned for and surrounded by industrial development; therefore, development of laboratory buildings would be consistent with surrounding development patterns and would not present an aesthetic intrusion.

With respect to the Lab's main hill site, as stated in Section IV.A, implementation of the proposed 2006 LRDP would alter views of the LBNL site from nearby areas, including the Lawrence Hall of Science and residential neighborhoods and commercial areas in the cities of Berkeley and Oakland. In general, views of the Lab hill site would be incrementally intensified because additional buildings would be visible, although no buildings would be constructed of a height and/or without sufficient screening such that they would dramatically stand out from existing Lab development in long-range views of the hillside. While some observers would not consider the changes in the existing visual setting to be substantial, visual quality is subjective, and different observers may have different reactions to changes in long-range views of the Lab's hill site, with some people likely to find the increase in building density, even though partially screened, to be disruptive or even offensive. Therefore, for purposes of a conservative analysis, this EIR concludes that the proposed LRDP, as described by the Illustrative Development Scenario shown in the visual simulations, would potentially have a substantial adverse effect on scenic vistas, and might be found by some observers to substantially damage scenic resources. Because the Off-Site Alternative would still develop more than half of the Lab's new space at the

main hill site, visual impacts would remain significant and unavoidable with implementation of this alternative, as with the project. Also as with the project, light and glare impacts would be less than significant with mitigation and construction-period and cumulative impacts would be less than significant.

V.G.2.2 Air Quality

Compared to the proposed project, the Off-Site Alternative would result in similar construction air quality impacts, and mitigation measures adopted as part of the proposed project would also apply under this alternative. Less development at the hill site would result in proportionately lower local air quality impacts than the 2006 LRDP, and impacts would be less than significant. The project's contribution to regional air quality emissions would be comparable to the emissions analyzed for the proposed project since the overall level of new development would be the same as initially proposed under the 2006 LRDP when the Notice of Preparation was issued. As with the project, this alternative would result in a cumulative significant impact with regard to toxic air contaminant emissions.

V.G.2.3 Biological Resources

Biological resources impacts at the hill site would be similar to those of described for the proposed project, although they would be incrementally lower than those of the 2006 LRDP since less development would occur. Mitigation measures applicable to the proposed project would also apply to this alternative, reducing impacts at the hill site to less-than-significant levels. The Off-Site Alternative would increase the developed area at the RFS and would potentially affect sensitive biological resources at the site, including native grasslands, coastal salt marsh, raptor nesting, and possibly roosting locations for special-status bat species. Construction of new buildings at the RFS site would likely occur outside of the areas where sensitive biological and wetland resources are present, due to regulatory restrictions and the continued use of those parts of the site for research. With mitigation similar to that identified for the LBNL hill site, impacts to biological resources at the RFS site would be likely be less than significant.

V.G.2.4 Cultural Resources

The Off-Site Alternative would result in cultural resources impacts similar to those of the proposed project, resulting in a significant and unavoidable impact at the hill site due to the loss of historical resources. Significant and unavoidable impacts related to demolition and construction activities that could affect as-yet unidentified historical resources, and the demolition of the Bevatron, would remain under this alternative. Mitigation measures applicable to the proposed project to reduce impacts to archaeological resources and the potential to disturb human remains would apply to this alternative, and, as with the proposed project, would reduce impacts to less-than-significant levels.

V.G.2.5 Geology and Soils

Geology and soils impacts at the hill site under the Off-Site Alternative would generally be the same as described for the proposed project, although less development on the hill site, and therefore a lower ADP, would reduce the exposure to geologic and seismic hazards. Mitigation measures applicable to the proposed project would apply to this alternative, and would reduce impacts at the hill site to less-than-significant levels. No apparent geologic constraints exist at the RFS site that would result in unmitigable geologic or seismic hazards. With mitigation, geology and soils impacts at the RFS site would be less than significant.

V.G.2.6 Hazards and Hazardous Materials

Hazards and hazardous materials impacts at the hill site under the Off-Site Alternative would generally be the same as described for the proposed project, although impacts associated with hazards and hazardous materials would be incrementally less, corresponding with less development at the hill site under this alternative. The RFS site has a history of soil and groundwater contamination. Any residual contamination would be required to be remediated in compliance with applicable regulatory standards prior to implementation of the Off-Site Alternative. At the LBNL main site, mitigation measures applicable to the proposed project would apply to this alternative and would reduce impacts to less-than-significant levels.

V.G.2.7 Hydrology and Water Quality

Hydrology and water quality impacts at the hill site under the Off-Site Alternative would generally be the same as described for the proposed project, although impacts would be incrementally less, corresponding with less development on the hill site under this alternative. Additional development at the RFS site would likely increase the amount of impermeable surface at that site, with associated increases in stormwater runoff and surface contaminants. To the extent that infrastructural improvements would be necessary to accommodate these increases, they would likely be required, and the resulting impacts to hydrology, drainage, and water quality would be less than significant.

V.G.2.8 Land Use and Planning

The land use and planning impacts of the Off-Site Alternative would be the same as described for the proposed project since this alternative would result in a similar mix of land use on the hill site, albeit at a lesser development intensity. While this alternative would increase development at the RFS site, because the RFS includes existing research uses and is located near industrial uses on land that is zoned for such uses, this alternative would not introduce incompatible land uses to the RFS site. As with the proposed project, land use impacts would be less than significant.

V.G.2.9 Noise

Construction noise impacts and the increase in the ambient noise level at the hill site under the Off-Site Alternative would be incrementally less than the proposed project. The decrease in noise

impacts would result from less construction and demolition activity, as well as a smaller overall development program at the hill site. Mitigation measures adopted as part of the proposed project would apply to this alternative and would reduce the severity of these impacts, but likely not to a less-than-significant level, and construction noise would remain significant and unavoidable, as with the project. While this alternative would increase development at the RFS, there are fewer sensitive receptors in the vicinity of the RFS, compared to the hill site. Additionally, new construction at the RFS would be subject to the proposed project's construction noise mitigation measures to reduce impacts to less-than-significant levels. As with the proposed project, operational noise impacts would be less than significant with mitigation.

V.G.2.10 Population and Housing

The population and housing impacts of the proposed project are regional in nature, since the Lab's ADP originates from locations throughout the Bay Area. Therefore, impacts under the Off-Site Alternative would be similar to the project's less-than-significant population and housing impacts. Demand for housing in the vicinity of the RFS could increase and demand for housing in the immediate vicinity of the hill site could decrease, compared to the proposed project, under this alternative. As with the project, the impacts attributable to increases in the population and housing demand under this alternative would be less than significant.

V.G.2.11 Public Services and Recreation

The ADP on the hill site under the Off-Site Alternative would be roughly three-quarters of the ADP under the proposed project; therefore, the demand for public services at the hill site would be proportionately lower. At the RFS, the University provides police protection, with emergency service available from the Richmond Police Department. The Richmond Fire Department provides emergency fire response services. The Off-Site Alternative would result in incremental increases in demands for these public services, but impacts to public services under this alternative would be less than significant.

V.G.2.12 Transportation/Traffic

Under the Off-Site Alternative, the transportation/traffic effects at the hill site, as compared to the 2006 LRDP, would be the same as those discussed under the Reduced Growth 1 Alternative because the ADP, occupiable building space (including demolition and new construction activities), and parking facilities on the hill site would be identical under the two alternatives. This alternative would therefore have a less-than-significant impact on the intersection of Hearst Avenue at Gayley Road/La Loma Avenue, rather than the significant and unavoidable impact that the 2006 LRDP project would have, for the reasons explained for the Reduced Growth 1 Alternative. Similar to the proposed project, the installation of traffic signals at two other intersections (Gayley Road/Stadium Rim Way and Durant Avenue/Piedmont Avenue) would be necessary to mitigate significant impacts, and mitigation measures identified for the project (installation of traffic signals) would be required to reduce these impacts to less-than-significant levels. Also as with the project, because LBNL could not implement these measures on its own, the impact at these intersections would be considered significant and unavoidable. Compared to

the proposed project, this alternative would result in incrementally lesser transit impacts, while pedestrian, bicycle, and parking impacts would be similar; these impacts would all be less than significant. The Off-Site Alternative would result in new development at the RFS to accommodate a portion of the Lab's projected growth, which would in turn increase shuttle and private-vehicle trip generation to and from the RFS. The increase of 390 ADP at the RFS site could increase traffic congestion at local intersections in the RFS vicinity and would be potentially significant, pending assessment of specific site and operations plans.

V.G.2.13 Utilities, Service Systems, and Energy

The Off-Site Alternative would result in lower development and associated demand for utilities, service systems and energy at the hill site. Mitigation measures applicable to the proposed project to reduce potential impacts to less-than-significant levels would also apply to this alternative. Utility, service system and energy demand at the RFS would increase under this alternative, but based on the provision of utilities for existing research and other activities at the RFS site, it is anticipated that sufficient utilities and service systems would be able to be made available for further development at the site. Moreover, any future development at the RFS site would be required to fund its fair share of the infrastructure improvements necessary to support it. Impacts to utilities and service systems would therefore be less than significant with mitigation.

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CHAPTER VI
CEQA Considerations

Introduction

This section summarizes the findings with respect to significant, unavoidable environmental impacts; growth-inducing impacts; cumulative impacts of the proposed project; and significant irreversible changes.

VI.A. Significant, Unavoidable Effects

As described in Chapter IV, implementation of the LRDP would result in the following significant impacts that could not be mitigated to a less-than-significant level:

VI.A.1 Aesthetics

Impact 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.

Impact 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.

> The Lab's hill site would continue to appear as a vegetated hillside with buildings among trees and shrubs. The natural and manmade topography of the site limits views from any one vantage point to a relatively small portion of the hill site, and development under the LRDP would be guided by the LRDP principles and strategies and LBNL Design Guidelines. Although changes to the site would occur in the context of existing development and not affect pristine views, some of the visual impacts might appear substantial to at least some viewers. In other instances, while the overall visual character of the site may remain similar, there might be substantial new buildings included in the vista. Moreover, some observers might perceive a substantial adverse change in the on-site visual character from construction of individual buildings. Given that aesthetic impacts are inherently somewhat subjective, and given the totality of potential development even though many individual buildings would not have a substantial effect, and also to provide a conservative analysis that avoids any possible under-estimation of impacts, this EIR concludes that the project would potentially have a substantial adverse effect on scenic vistas, and might be found by some observers to substantially damage scenic resources. In light of the above, the project's effect on aesthetics and visual quality is determined to be significant.

VI.A.2 Air Quality

Cumulative Impact 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.

Implementation of the proposed 2006 LRDP would not result in a project-specific increase in lifetime cancer risk at off-site receptors in excess of 10 cases in one million, and this impact would be less than significant. (One on-site receptor would sustain increased cancer risk of greater than 10 in one million, but this significant impact was found to be reduced to a less-than-significant level with implementation of mitigation identified in the DEIR.) Nevertheless, the lifetime cancer risk from exposure to emissions from Berkeley Lab, including emissions from mobile sources such as the Lab's shuttle buses and from auto and truck traffic entering and leaving the Lab, would continue to exceed 10 in one million, even though there would be no project-related increases in excess of that threshold. Although the Lab's contribution to total lifetime cancer risk at any location would be relatively small, compared to the average risk of 480 in one million throughout the Bay Area, this EIR considers the contribution to be considerable, and therefore the cumulative impact would be significant.

VI.A.3 Cultural Resources

Impact 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.

Although analyzed in a separate EIR, demolition of Building 51 (including the Bevatron) would occur during the lifetime of the LRDP and, because this EIR considers Building 51 as part of the existing setting, demolition of Building 51 would be a significant and unavoidable impact of the 2006 LRDP, as well. Along with previously completed Historic American Engineering Record (HAER) documentation, which included a written historical and architectural description of the building and accelerator, and extensive photographic recordation, LBNL would prepare a Historic American Building Survey (HABS) addendum to the HAER and also would create a monument and/or display regarding the history of the Bevatron. These mitigation measures would reduce the effects of demolition of Building 51, but not to a less-than-significant level. Concerning other potential historical resources, preliminary research findings suggest that Building 71 and Building 88 may be eligible for listing in the National Register. There are no current plans to demolish Buildings 71 and 88. However, should the buildings prove to be eligible for National Register listing, their demolition under the 2006 LRDP would result in a significant and unavoidable impact, even with mitigation identified in the DEIR. Should SHPO identify other buildings at LBNL as eligible for listing on the National Register, their demolition under the 2006 LRDP would also result in a significant and unavoidable impact, even with mitigation identified in the DEIR.

VI.A.4 Noise

Impact NOISE-1: Development under the proposed LRDP would result in temporary noise impacts related to construction and demolition activities.

Cumulative Impact NOISE-5: Development under the proposed LRDP would result in temporary contributions to cumulative noise impacts related to construction and demolition activities.

> Although in most instances, it can reasonably be anticipated that construction noise impacts on off-site receptors would be reduced to a less-than-significant level through implementation of the above mitigation measures, there may be individual construction and/or demolition projects undertaken during the life of the 2006 LRDP that result in noise impacts that could not be fully mitigated. Therefore, the impact of construction noise is considered to be significant and unavoidable.

VI.A.5 Transportation

Impact TRANS-1: Implementation of the 2006 LRDP would degrade level of service at certain local intersections.

Cumulative Impact 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.

> Installation of a traffic signal would mitigate the significant impacts at two intersections to a less-than-significant level: Gayley Road/Stadium Rim Way and Durant Avenue/Piedmont Avenue. Because LBNL could not implement these measures on its own, but would need the cooperation of UC Berkeley and/or the City of Berkeley, the impact at these intersections also would be considered significant and unavoidable. 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). In addition, LBNL shall develop and implement a new Transportation Demand Management (TDM) Program to replace its existing TDM program. The new TDM Program has been drafted in consultation with the City of Berkeley, and includes several implementation phases tied to the addition of parking to LBNL. The TDM 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 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.

Mitigation measures have been identified for all other significant impacts identified in this EIR. Therefore, no other impacts were determined to be significant and unavoidable.

VI.B. Growth Inducement

As described in Section III.J, Population and Housing, the project would 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. The proposed LRDP, in conjunction with the 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.

VI.C. Cumulative Impacts

The California Environmental Quality Act (CEQA) defines cumulative impacts as two or more individual effects which, when considered together, are substantial or which compound or increase other environmental impacts. The cumulative analysis is intended to describe the "incremental impact of the project when added to other, closely related past, present, or reasonably foreseeable probable future projects" which can result from "individually minor but collectively significant projects taking place over a period of time (state CEQA *Guidelines* Section 15355).

Cumulative impacts that may occur as a result of the project are discussed in the appropriate sections of Chapter IV of this report. The cumulative analysis in each section of Chapter IV considers cumulative growth as represented by the implementation of the Berkeley and Oakland general plans (and thus includes growth anticipated by the 2001 City of Berkeley General Plan EIR), and implementation of the UC Berkeley 2020 LRDP (including the Southeast Campus Integrated Projects) along with implementation of the proposed LBNL 2006 LRDP. (Demolition of the Building 51 complex—housing the Bevatron accelerator—although the subject of a separate project-specific EIR, is analyzed as part of the 2006 LRDP because the buildings were in place when the EIR analyses were undertaken.) Also included in the cumulative development assumptions are several projects at LBNL that are proceeding or could proceed separately from the 2006 LRDP, although in some cases the impacts of these projects are also included in the analysis of the 2006 LRDP for purposes of a conservative assessment of overall project impacts. These projects include:

- Demolition of Building 51 and the Bevatron: 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, shop, and office functions. Under the proposed 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 firm plans for future development of the underlying site at this time.

  Demolition would entail the removal of approximately 20,000 to 26,000 tons of reinforced 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.

The duration of the physical work for the project may vary from four to seven years, and would take place between approximately 2008 and 2012 or later, contingent upon funding and results of material sampling

A Draft EIR for the Bevatron demolition project, tiered from the 1987 LRDP DIR, as amended, has been prepared and circulated for public review.

- User Support Building: This proposed three-story, approximately 30,000 gsf 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 Environmental Assessment or Categorical Exclusion are expected to be prepared and circulated in the fall / winter of 2006. 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. (See Appendix D for further details.)

- Computational Research and Theory (CRT) Building: As currently projected, the CRT Building would likely be proposed as a six-story, 65,000-gsf building constructed near the Blackberry Gate entrance to the Lab main site. 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. CEQA review would be conducted and an appropriate document circulated for public review sometime around mid-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-gsf laboratory building constructed just south of existing LBNL buildings 66 and 62. 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. CEQA and NEPA review would be conducted and appropriate documents circulated for public review sometime around fall/winter 2008.

- The rehabilitation of Buildings 77 and 77A, already approved, which will replace the roof of Building 77; upgrade various utility systems in both buildings; add an interior crane to Building 77A; and construct a small nearby building to house chillers, a cooling tower, boilers, and associated equipment.

- As a condition of the Hazardous Waste Facility Permit issued by the Department of Toxic Substances Control (DTSC), LBNL has been required to investigate and address historical releases of hazardous wastes and materials that may have occurred at the site. Cleanup activities have already been conducted in some areas as part of Interim Corrective Measures that were implemented to protect human health or the environment. The final step of the cleanup process is to determine the best way to clean the remaining contamination and to begin the final clean up. The document evaluating possible cleanup methods and recommending which cleanup methods to implement, called the Corrective Measures Study Report, or CMS Report, was made available to the public and other agencies for their review and comment, and was approved by DTSC effective October 2005. The selected cleanup measures of the CMS Report are being put in place as part of the Corrective Measures Implementation phase of the RCRA Corrective Action Plan process.

- Development of an Animal Care Facility (ACF), planned as an approximately 7,100-gross-square-foot (gsf) one-story building located on the eastern side of the Lab's main hill site, northwest of Building 83. The ACF would replace the nearby existing 8,500-gsf animal care unit in Building 74, which is nearing obsolescence due to aging and unreliable mechanical equipment, and potential seismic inadequacy. If seismic upgrades are made to Building 74, the vacated space in that building likely would be converted to wet and dry laboratories and used for the same types of research activities, some of which already take place at Building 74 and others of which take place at other buildings at LBNL. The ACF is anticipated to be completed in 2007.

- Construction and operation of a new Guest House to serve visiting scientists, faculty and students. Many of the visitors using the Lab's facilities—the Advanced Light Source, National Center for Electron Microscopy, 88" Cyclotron, and Molecular Foundry—are from outside the Bay Area and must obtain short-term housing. The Guest House would be a 25,000-gsf, three-story building with approximately 60 guest rooms and would provide on-site, low-cost, short-term housing. The site designated for the Guest House is near the center of the Laboratory, west and southwest of Building 2 and on the site of the demolished Building 29 and Trailer 29D, and existing Trailers 29A, 29B, and 29C. Construction is anticipated to begin in early 2007 and be complete in mid-2008.

As noted, development pursuant to the UC Berkeley 2020 LRDP is assumed in the cumulative analyses in this EIR. The UC Berkeley 2020 LRDP and LRDP EIR project population increases of up to 12 percent (approximately 5,320 "heads") and built space increases of up to 18 percent (approximately 2.2 million gsf) by the year 2020. The Regents approved the UC Berkeley 2020 LRDP and certified the LRDP's EIR on January 20, 2005. The environmental analyses assumed no more than one million gsf of construction would be underway at any one time within the Campus Park, Adjacent Blocks, Southside and Hill Campus land use zones, which is approximately equal to the maximum level of construction that was underway at the time the Existing Setting data were collected in 2002 and 2003. Thus, the aggregate effects of the maximum level of construction foreseen under the UC Berkeley 2020 LRDP are already reflected in the existing setting. The UC Berkeley 2020 LRDP EIR also included a project-level analysis of the Chang-Lin Tien Center for East Asian Studies, two buildings totaling about 110,000 gsf, the first of which is under construction.

In October 2006, UC Berkeley completed a Tiered, Focused EIR for the Southeast Campus Integrated Projects (SCIP), which include seismic and program improvements at the California Memorial Stadium, including a 158,000-gsf athletic training center and 102,000 gsf of additional new academic and support space at the stadium; construction of a parking structure and sports field at the current site of Maxwell Family Field; construction of an 186,000 gsf building linking the Law and Business schools, landscape improvements at the Southeast Campus and Piedmont Avenue; interior improvements at selected buildings at the School of Law and the Haas Business School; and renovation and restoration of the Piedmont Avenue houses (five structures and site environs from 2222 to 2240 Piedmont Avenue). The SCIP EIR, tiered from the UC Berkeley 2020 LRDP EIR, identified significant, unavoidable impacts in the areas of aesthetics (effects on the character of Gayley Road and on views from Panoramic Hill); cultural resources (changes to Memorial Stadium, demolition of several structures, and alterations to buildings and landscape along Piedmont Avenue); geology (earthquake risk); noise (due to construction and demolition

and due to the potential for additional events at the stadium); traffic (effects at the Durant/Piedmont and Bancroft/Piedmont intersections[1]); and utilities and service systems (increased demand on wastewater facilities) (UC Berkeley, 2006).

Additional projects currently under way at UC Berkeley are also accounted for in the LBNL 2006 LRDP EIR cumulative analysis. These include:

- Development of an Early Childhood Education Center, serving up to 78 children, on the north side of Haste Street, mid-block between Dana and Ellsworth Streets, anticipated to be complete in early 2007;
- Construction of Stanley Hall, a 285,000-gsf, eight-story building nearing completion at the East Gate of the campus next to the Hearst Memorial Mining Building;
- Development of the Center for Information Technology Research in the Interest of Society (CITRIS) Headquarters, located in the northeast section of the campus near the intersection of Hearst and LeRoy Avenues, a 142,000-gsf structure expected to be completed in 2008;
- Seismic retrofit the Bancroft Library, which is located in the central portion of the campus to the north of Wheeler Hall between South Hall Road and Sather Road, under way through 2007;
- Construction of a pedestrian bridge, connecting the north and south components of the Foothill housing project, over Hearst Avenue just east of Gayley Road, to provide Americans with Disabilities Act-compliant access (expected completion in early 2007).

Finally, the cumulative analyses include development within the city of Berkeley as envisioned in the 2001 City of Berkeley General Plan and EIR. The 2001 City of Berkeley General Plan allows for steady growth and development, but, given a lack of substantial undeveloped space in the City, this would take place at a relatively even pace with an emphasis on infill development. Projections include a population increase of approximately 7,000 people (a roughly six percent increase), approximately 3,300 new household units (a roughly eight percent increase), and approximately 3,700 new jobs (a roughly five percent increase) by the year 2020.

VI.D. Significant Irreversible Changes

Certain aspects of development projects or the implementation of plans can result in irreversible environmental changes, such as when a General Plan directs a change in land use by committing a community to urbanization of farmland or when a project or plan extends urban services or transportation infrastructure to areas not currently so served. The use of large quantities of nonrenewable resources (e.g., fossil fuels) may also be considered such an irreversible change. Another type of irreversible change would be demolition, particularly of historical resources that, once gone, cannot be replaced.

[1] These impacts could be mitigated with the implementation of mitigation measures from the UC Berkeley 2020 LRDP EIR but are identified as significant and unavoidable because they are outside the jurisdiction of The Regents and could only be implemented at the discretion of the City of Berkeley.

The proposed 2006 LRDP would not result in irreversible changes related to land use. As noted in Section IV.H, Land Use, implementation of the 2006 LRDP could change the distribution of specific research-related uses at the main hill site, but would not fundamentally alter land use at the site, and Berkeley Lab would continue to operate as a scientific research institution.

The proposed 2006 LRDP would not extend services or roadways to areas not currently provided with such services. On-site utilities would be improved and capacity increased where necessary to serve the Lab but population growth at the Lab would be less than 1.5 percent per year, parking and traffic generation would increase by comparable amounts, and no significant impacts would ensue in connection with Population and Housing, Public Services, or Utilities, as described in Chapter III, Project Description, Section IV.J, Population, Section IV.K, Public Services, Section IV.L, Transportation, and Section IV.M, Utilities.

As described in Section IV.D, Cultural Resources, implementation of the 2006 LRDP would cause a substantial adverse change in the significance of historical resources, including historical resources that have not yet been identified. At a minimum, demolition of the Building 51 complex, including the Bevatron accelerator, is anticipated during the lifetime of the 2006 LRDP. This is identified as a significant, unavoidable impact in Section IV.D.

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CHAPTER VII
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CHAPTER VIII
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CHAPTER IX
Acronyms and Abbreviations

$\mu g/m^3$	Micrograms per cubic meter
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACCWP	Alameda Countywide Clean Water Program
ACGIH	American Conference of Governmental Industrial Hygienists
ACM	Asbestos-containing materials
ADA	Americans with Disabilities Act
AMSL	Above Mean Sea Level
ANSI	American National Standards Institute
AOC	Area of Concern
ARB	California Air Resources Board
ASL	Advanced Light Source
AST	Aboveground storage tank
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BL	Biosafety Level
BMPs	Best Management Practices
Bq	Becquerel
Cal/EPA	California Environmental Protection Agency
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CAP	Clean Air Plan
CARB	California Air Resources Board
CARB	California Air Resources Board
CBC	California Building Code
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDMG	California State Department of Conservation, Division of Mines and Geology (now known as California Geological Survey)
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (a.k.a. Superfund)

CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
CGS	California Department of Conservation, Geological Survey
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
Ci	Curie
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	Carbon Monoxide
CUPA	Certified Unified Program Agency
CVC	California Vehicle Code
CWA	Clean Water Act
dB	Decibels
dBA	A-Weighted Decibels
DHS	(California) Department of Health Services
DOE	United States Department of Energy
DPM	Diesel Particulate Matter
DTSC	(California) Department of Toxic Substances Control
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Park District
EH&S	LBNL Environment, Health, and Safety (Division)
EIR	Environmental Impact Report
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Environmental Science Associates
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FY	Fiscal Year
gpd	Gallons per day
gsf	Gross square feet
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HAPs	Hazardous Air Pollutants
HEPA filter	High Efficiency Particulate Air filters
HMMP	Hazardous Materials Management Plan
HVAC	Heating Ventilation Air Conditioning

HWHF	Hazardous Waste Handing Facility
Hz	Hertz
kv	Kilovolts
kVA	Kilovolt (Annual)
kW	Kilowatts
lb/day	Pounds Per Day
LBL/LBNL	Lawrence Berkeley Laboratory/Lawrence Berkeley National Laboratory
LEED	Leadership in Energy & Environmental Design
Leq	Energy-Equivalent Noise Level
LOS	Level of Service
LRDP	Long Range Development Plan
LTS	Less than Significant
MACT	Maximum Achievable Control Technology
MEI	Maximally Exposed Individual
mgd	Million Gallons Per Day
MM	Modified Mercalli
MOA	Memorandum of Agreement
mph	Miles Per Hour
MRZ	Mineral Resource Zones
MVA	Mega-Volt-Amperes
MWh	Megawatt hours
NAHC	Native American Heritage Commission
NCI	National Cancer Institute
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Airborne Pollutants
NO_2	nitrogen dioxide
NOP	Notice of Preparation
NOx	Nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
OEHHA	(California) Office of Environmental Health Hazard Assessment
OSHA	United States Occupational Health and Safety Administration
PCBs	Polychlorinated Biphenyls
PG&E	Pacific Gas & Electric Company
PM-10	Particulate Matter – 10 microns or smaller
PM-2.5	Particulate Matter – 2.5 microns or smaller
PNNL	Pacific Northwest National Laboratory

ppm	Parts Per Million
PRC	Public Resources Code
psi	Pounds Per Square Inch
Rad	Roentgen Absorbed Dose (a measure of radiation energy absorbed per gram of medium)
RCRA	Resource Conservation and Recovery Act
REL	Reference Exposure Level
rem	Roentgen Equivalent Man (a measure of biological harm done by radiation)
RfD	Reference Dose
ROG	Reactive Organic Gases
RWQCB	(California) Regional Water Quality Control Board (San Francisco Bay Region, unless otherwise noted)
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SEIR	Supplemental Environmental Impact Report
sf	Square feet
SHMA	Seismic Hazards Mapping Act
SHPO	State Historical Preservation Officer
SIP	State Implementation Plan (air quality plan)
SLAC	Stanford Linear Accelerator Center
SO_2	Sulfur Dioxide
SPCC	Spill Prevention Control and Countermeasure
SWMP	Storm Water Monitoring Plan
SWMU	Solid Waste Management Unit
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminant
TCMs	Transportation Control Measures
TLV	Threshold Limit Value
TMDL	Total Maximum Daily Load
TSCA	Toxic Substances Control Act
UBC	Uniform Building Code
UC	University of California
UCB	University of California, Berkeley
UCOP	University of California, Office of the President
UCPD	UC Berkeley Police Department
URF	Unit Risk Factor
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey