CHAPTER V
Alternatives

A. Introduction

CEQA requires an evaluation of the comparative effects of "a reasonable range of potentially feasible alternatives" to the project. Alternatives to be considered are those that "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)).

The proposed project would result in a significant and unavoidable impact to historic resources. This chapter discusses two alternatives to the project that would reduce its impact to historic resources, and one alternative that would reduce its already less than significant traffic impacts: 1) No Project Alternative, 2) Preservation Alternative, and 3) On-Site Rubbling Alternative. An Adaptive Reuse Alternative and an alternative of encasing the facility and using it as a central courtyard for future development of the site are discussed in subsection C, *Alternatives Considered But Rejected as Infeasible*.

The above alternatives were selected in consideration of one or more of the following factors:

- the extent to which the alternative would accomplish the basic objectives of the project (see below);
- 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; and

- the requirement of CEQA Guidelines to consider a "no project" alternative as well as an "environmentally superior" alternative (CEQA Guidelines Section 15126.6).

As stated under "Project Objectives" in Chapter III, Project Description, the primary objectives of the Building 51 and the Bevatron Demolition Project are as follows:

- To eliminate existing potential hazards associated with Building 51.
- To reduce the burden on existing LBNL maintenance resources.
- To free space for potential future activities.
- To help meet a DOE policy requiring that the square footage of new construction at a DOE facility be balanced by elimination of an equivalent amount of excess space.

Of the alternatives assessed in this EIR, the alternative with the least environmental impact is the No Project Alternative. CEQA Guidelines Section 15126.6(e)(2) states that if the environmentally superior alternative is the no project alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. Among the other alternatives, the Preservation Alternative is determined to be the environmentally superior alternative, because it would also reduce some of the impacts associated with the proposed project, including significant and unavoidable impacts to historic resources.

B. No Project Alternative

Description

CEQA Guidelines Section 15126.6(e)(1), requires that an EIR evaluate a "no project" alternative along with its impact in order to provide a comparison of the impacts of approving the proposed project with the impacts of not approving the proposed project. Pursuant to CEQA Guidelines Section 15126.6(e)(3)(B), the No Project Alternative discusses "the property remaining in its existing state." Under this alternative, the Bevatron would not be dismantled and Building 51 would not be demolished. Radioactive materials, as well as other hazardous materials such as lead dust, oils, and asbestos, would continue to remain in place.

Impact Analysis

As compared with the proposed project, this alternative would not create many of the impacts described in Chapter IV of this EIR. In particular, the No Project Alternative would avoid the significant cultural resources impacts associated with the demolition of Building 51 as a historic resource, because it would retain those features which justify its eligibility for listing in the National Register of Historic Places. However, this alternative would not achieve any of the goals of the proposed project.

Under this alternative, the induced radioactivity contained in the concrete and other material of the Bevatron would remain on site and continue to decay over time.[1] The facility would remain a long-term maintenance and financial drain on LBNL, and would not address the multiple legacy hazards on site. As indicated in the Project Description, the Bevatron has not operated since 1993 and is non-functional. The Building 51 structure housing the Bevatron does not meet current building codes or standards, including seismic design standards, and, as it is relatively old and deteriorating (e.g., roof leaks exist in several locations), it consumes disproportionate maintenance resources. Currently, the building and its contents are in fair to poor condition. Other hazards also exist, e.g. unabated hazards for lead dust, lead paint, and asbestos. Because of these problems, all present occupants are slated for relocation during 2005-2006. Further, this alternative would not avoid long term significant cultural resources impacts, because the deterioration of Building 51 and Bevatron would continue and eventually, the value of the historic resource would be lost. Lastly, this alternative would not include any hazard abatement or seismic upgrade activities, and therefore, long-term impacts to worker or public health could be greater than under the proposed project.

C. Preservation Alternative

Description

Under the Preservation Alternative, the entire site would be dedicated to non-LBNL uses and could be managed by another public agency, such as the National Park Service, with the intention of actively preserving Building 51 and the Bevatron equipment within it. The public agency would maintain and preserve the building in accordance with the *Secretary of the Interior's Standards for Preservation*, and would allow limited public access for interpretive/educational purposes. These 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. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project." This alternative would also allow some level of abatement of hazardous materials, such as lead and asbestos removal, to the extent that abatement can be accomplished while maintaining the Bevatron equipment in place.

This alternative would greatly reduce or eliminate the significant impact to historical resources that would be created by the proposed project, but would not achieve most of the Laboratory's goals for the site. Apart from the other disadvantages of the Preservation Alternative, the facility

[1] This alternative is also a decay-in-place alternative. The nuclei of radioactive atoms are unstable. Over time, the nuclei will eventually decay by emitting a particle and/or radiation, which transforms the nucleus into another nucleus, or into a lower energy state. The chain of decays continues until the resulting nucleus is stable. Decay for an interval of 10 half-lives would reduce the radioactivity to roughly 1/1000 of the original. Thus, for Co-60, which has a half-life of 5.2 years; decay for 52 years would reduce the Co-60 radioactivity to roughly 1/1000 of its present value.

would still require long-term maintenance and substantial financial investment for clean-up and refurbishment. This would include such things as significant re-roofing and exterior waterproofing. Reinforcement may be required to strengthen the structure. New rollup doors would also be required to replace those that were either removed or are inoperable. Due to the continuing presence of hazardous materials, the facility would have to be patrolled periodically to prevent unauthorized uses, and as would be the case for any unoccupied building, to ensure that it did not become occupied by unwanted animals or pests.

Impact Analysis

Aesthetics

As stated above, under the Preservation Alternative, some hazardous materials abatement would occur and Building 51 would be refurbished and maintained to sustain the existing form, integrity, and materials of an historic property. The aesthetics changes due to temporary construction and on-going maintenance activities under the alternative would be smaller than the less-than-significant aesthetics impacts of demolition activities under the project. Under the Preservation Alternative, the site would continue to look much the same as it does now, so that the long-term change and its aesthetic impact would be less-than-significant. Under the proposed project, the Bevatron and Building 51 would be removed and the site would be replaced with an open, revegetated area, a larger visual change that is nonetheless considered a less-than-significant aesthetic impact. Overall, the Preservation Alternative would have a smaller aesthetic impact than would the Project.

Air Quality

The hazardous materials abatement and historic property maintenance activities that would be carried out under this alternative would result in continuing minor air quality impacts that would not exist under the proposed project, as maintenance vehicles and equipment would emit relatively small quantities of tailpipe emissions and possibly emissions of volatile compounds from roofing materials, paint, and the like. However, these emissions would create less-than-significant impacts to air quality. In addition, because this alternative would require less overall use of construction/demolition equipment and substantially less truck traffic than would be required under the proposed project, the overall air quality impacts of the alternative likely would be smaller than the less-than-significant air quality impacts that would be created by the proposed project.

Biological Resources

Neither the project nor the alternative would result in tree or shrub removal or damage to trees, so neither would have the potential for direct adverse effects on nesting raptors and other special-status nesting birds, or special-status bats. Compared to the project, the lesser level of activities of the alternative would have a smaller potential to result in indirect impacts to these species. For the same reason, this alternative would have less potential to create impacts other biological resources.

Cultural Resources

Significant and unavoidable impacts to historic resources associated with the proposed project would be reduced to a less than significant level under the Preservation Alternative, because it would preserve Building 51 and the Bevatron equipment in their historic location and condition. As stated in CEQA Guidelines Section 15064.5(b)(3), a project that follows the Secretary of the Interior's Standards generally will be considered mitigated to a less than significant level. This alternative would be generally consistent with the Secretary of the Interior's Standards, and therefore, its impact would be mitigated to a less than significant level.

Under this alternative, the project's less-than-significant potential impacts associated with the accidental discovery of unknown archaeological resources due to excavations would be eliminated because this alternative would not involve disturbance of the ground at the project site.

Geology and Soils

Under the Preservation Alternative, while work would include preliminary measures to protect and stabilize the property in accordance with the Secretary of the Interior's Standards, it would not include extensive replacement and/or new construction. As Building 51 would not be brought up to current seismic standards, this alternative could result in a potentially significant seismic safety impact, because it would expose more people to potential injury as a result of seismic induced hazards. However, unless the building were occupied on a regular basis, this impact would likely be less than significant.

Hazards and Hazardous Materials

This alternative would result in less-than-significant impacts, similar to those of the project, that would be associated with the removal of hazardous materials, such as lead. However, this alternative would avoid the less-than-significant impacts associated with crystalline silica that would occur from demolition activities under the proposed project. Low-level radioactivity associated with the facility would remain in place.

Hydrology and Water Quality

This alternative would create less-than-significant impacts to hydrology and water quality that would be smaller than the impacts from the proposed project. Because this alternative would result in substantially less site activity and demolition than the proposed project, there is a lower potential for wastewater and runoff impacts than under the proposed project.

Under this alternative, impervious surfaces would not be removed as they would be under the proposed project. Therefore, the project operational beneficial impact to water quality would be eliminated under this alternative because pervious surfaces would remain in their existing condition at the project site.

Land Use and Planning

Under the Preservation Alternative, the land use of the project site would not change and therefore, land use impacts would be less than the less-than-significant impact that would occur under the proposed project.

Noise

The hazardous materials abatement and historic property maintenance activities that would be carried out under this alternative would create noise impacts that would be less than the less-than-significant noise impacts from the proposed project, because this alternative would require a smaller overall use of construction/demolition equipment and substantially less truck traffic than would be required under the proposed project.

Public Services

This alternative would create lesser impacts than the less-than-significant impacts from the proposed project, because temporary demolition-related roadway lane closures and detours would not occur, and project truck trips that could cause wear and tear on public roads and highways would be reduced or eliminated. However, as compared with the proposed project, the use of the facility under this alternative would require additional staff to operate, maintain and secure the facility, and there would be a greater potential need for public services to serve the site.

Transportation/Traffic

Because the hazardous materials abatement and historic property maintenance activities that would be carried out under this alternative would require a much lower overall use of construction/demolition equipment and substantially less truck traffic than would be required under the proposed project, this alternative would create transportation/traffic impacts that would be smaller than the less than significant impacts of the proposed project.

Utilities, Service Systems, and Energy

Under this alternative, Building 51 and the Bevatron would not be demolished and therefore, the need to dispose of the materials from the proposed demolition would be eliminated, thus resulting in substantially less materials movement and disposal than under the proposed project. Therefore, the effects associated with this alternative relate to utility demand (e.g. water and electricity use, wastewater generation, solid waste generation) on the site from additional staff that would be needed to operate, maintain and secure the facility. Some material disposal would result from upgrading mechanical, electrical, and/or plumbing systems and other code-required work to make the building functional, and would would create short-term, construction-related impacts that would be smaller than the less-than-significant utilities impacts from the proposed project. As noted above, under this alternative, long-term operational impacts would be greater than proposed project because under the proposed project, utility usage at LBNL would be reduced, since Building 51 would no longer exist and would not continue to generate demand for utilities. Under

this alternative, utility usage would continue since the building would be preserved; however, this impact would still be less than significant since the energy consumption that would result would not be wasteful, inefficient, or unnecessary; or otherwise exceed a standard of significance.

D. On-Site Rubbling Alternative

Description

Under the On-Site Rubbling Alternative, project activities would remain the same with the exception of activities related to concrete. A local "crushing plant" operation would be set up in the work zone outside of Building 51. Two large (approximately 35 feet [length] by 15 feet [width] by 10 feet [height]) diesel-powered concrete crushing machines would form the core of the operation. Concrete from shielding, the building walls and floor and foundation would be broken up using the crushing equipment. Following initial crushing, the material would require transfer by heavy equipment for processing through a second crusher to achieve the uniform sizing necessary to make the material attractive for reuse.

Under this alternative, most of the concrete from the building structure (i.e., walls and floors), foundation, and many of the concrete blocks shielding the Bevatron would be rubbled on-site. Metal (e.g., rebar) in the debris would be separated and disposed of separately. Only concrete free of detectable added (i.e., non-naturally-occurring) radioactivity and otherwise clear of contaminants would be rubbled. The rubbled material and segregated reinforcing steel would be recycled if public or private sector demand was available at the time of production. If not, it would be disposed of at a landfill. LBNL could use the rubble as aggregate or fill material if the need for such materials coincided with their production.

This alternative would share most of the advantages and disadvantages of the proposed project, although impacts would vary in some respects (e.g., this alternative would result in fewer truck trips). However, sufficient space adjacent to Building 51 does not currently exist for this alternative to be feasible, and a site or sites would have to be made available elsewhere at LBNL, at a sufficient distance from off-site sensitive receptors to avoid nuisance impacts.

Impact Analysis

Aesthetics

Under the On-Site Rubbling Alternative, long-term impacts to aesthetics would be the same as under the proposed project. However, as this alternative would result in increased on-site demolition activities and use of a larger area within the project site as compared with the proposed project, less-than-significant short-term impacts would be slightly greater than those from the proposed project.

Air Quality

Crushing of demolished materials for reuse as aggregate would greatly increase the amount of dust (PM_{10}) generated as compared to the proposed project. The amount of dust produced during crushing activities could be reduced by regularly watering the crushing operations to keep dust levels low. In addition, as compared with the proposed project, there would be additional heavy equipment, such as the concrete crushing machines themselves, which would produce additional diesel emissions. As would be the case for the proposed project, LBNL policies require subcontractors to comply with an array of federal and state requirements, including BAAQMD regulations and BAAQMD CEQA Guidelines, as well as OSHA regulations. These would ensure that impacts to air quality would be less-than-significant. Long-term non-construction impacts would be the same as those of the proposed project.

Biological Resources

Impacts to biological resources under this alternative would be larger than under the proposed project. While on-site rubbling would not result in tree or shrub removal or damage to trees, it would have a larger potential to result in impacts to nesting raptors and other special-status nesting birds, special-status bats, and other biological resources, due to increased noise generated by the rubbling equipment.

Cultural Resources

Impacts to cultural resources under this alternative would be essentially the same as under the proposed project since Building 51 and the Bevatron would still be demolished. Both impacts would be significant and unavoidable.

Geology and Soils

Geology and soils impacts under this alternative would be essentially the same as under the proposed project because the way in which the demolition waste is broken up after the building and Bevatron have been dismantled would not affect geology and soils.

Hazards and Hazardous Materials

As stated above, the only change to project activities under this alternative would be related to the handling concrete free of added radioactivity. All radioactive or suspected radioactive materials and other hazardous materials would be handled and disposed of as under the proposed project. Therefore, hazards and hazardous materials impacts under this alternative would be the same as those of the proposed project.

Hydrology and Water Quality

Hydrology and water quality impacts under this alternative would be essentially the same as under the proposed project, although the larger quantities of concrete dust that would be

generated would have to be controlled to prevent impacts to water quality. Use of LBNL procedures would keep these effects less-than-significant.

Land Use and Planning

Rubbling would require open areas for staging the broken but not yet rubbled concrete, maneuvering large heavy equipment to transfer broken concrete into the first crushing machine, and stockpiling the initially crushed material. In addition, a separate area would be required for the collection and consolidation of reinforcing steel. Sufficient space adjacent to Building 51 does not currently exist for such an operation, and a site or sites would have to be made available elsewhere at LBNL, at a sufficient distance from off-site sensitive receptors to avoid nuisance impacts. Therefore, this alternative could result in greater though still less-than-significant land use impacts than under the proposed project.

Noise

Noise produced under this alternative would not exceed the local noise limits discussed in Section IV.I, Noise. The noise generated would be greater than that under the proposed project if the concrete crushing equipment operated at the same time as other heavy demolition equipment. However, the incremental additional noise that would be created by this concrete crushing equipment would not be significant. Noise created by the hoe ram hammer, which would be used during demolition for both the proposed project and this alternative, is greater than the noise created by other project equipment, to the extent that the combined noise level of the activity is based predominantly on the use of the hoe ram hammer. The noise produced by the concrete crusher operating together with the hoe ram hammer would not result in significant noise increases over the level of the hoe ram hammer alone. Therefore, the noise levels would remain essentially the same for this alternative as for the proposed project.

Public Services

Under the On-Site Rubbling Alternative, impacts to public services would be essentially the same as under the proposed project because activities under this alternative would result in similar demand for public services. Impacts would be less-than-significant under both the proposed project and this alternative. Under this alternative, the proposed project-related less-than-significant impact related to potential project demolition truck trips that could cause wear and tear on public roads and highways would be slightly less than under the proposed project because this alternative would require slightly fewer heavy truck trips that would use public roadways.

Transportation/Traffic

Under this alternative, worker commute traffic would be essentially the same. However, truck traffic would be slightly reduced since a portion of the demolished concrete materials that otherwise would have to be sent off-site could potentially be reused on-site. Also, for the concrete that still would have to be shipped from the Laboratory, greater volumes could be transported per truck because rubbled concrete would better conform to the shape of truck beds, thereby allowing

fewer truck trips. A reduction in truck trips would reduce the already less-than-significant impacts that would be created by the proposed project.

Utilities, Service Systems, and Energy

Under this alternative, non-radioactive concrete waste would be crushed and reused at a later date at LBNL or at other locations. Reuse of the material as aggregate or for roadbeds would decrease the amount of material entering the waste stream. However, the On-Site Rubbling Alternative would result in approximately the same opportunity for the recycling of materials as the proposed project and therefore, impacts related to solid waste would be essentially the same as under the proposed project. In addition, water and wastewater use would be essentially the same as under the proposed project. Rubbling the material on-site would increase on-site energy use; however, this would still be a less than significant since the energy consumption that it would require would not be wasteful, inefficient, or unnecessary; or otherwise exceed a standard of significance.

E. Alternatives Considered but Rejected as Infeasible

The following alternatives were considered for inclusion in this EIR, but were rejected from further consideration because they would not meet the objectives of the project and/or avoid or substantially lessen the potential impacts of the proposed project without also creating new potentially significant effects.

Adaptive Reuse Alternative

An Adaptive Reuse Alternative would keep as much of the Building 51 structure as practical, remove the Bevatron and other unused equipment, and construct new offices or laboratories inside the structure. Under this alternative, the building would be structurally upgraded. This would include extensive rebuilding to seismically update the building and to meet current building code requirements. The roof and exterior cladding and window systems would be removed and replaced with insulated and weather-tight roofing, glazing, and siding; mechanical and electrical systems would be removed and replaced with updated systems; and existing hazards such as lead dust, lead paint, and asbestos would be abated.

Although the building's structure would remain, this alternative would not avoid the significant impacts to historic resources associated with the proposed project because the adaptive use alternative would remove the Bevatron equipment, which is a historic 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 alternative.

This alternative would also eliminate most of the existing potential hazards associated with Building 51, and reduce some of the burden on existing LBNL maintenance resources, although not to the extent achieved by the proposed project. Costs for hazard abatement and Bevatron and equipment removal would be similar. However, this alternative would be more costly, in terms of building and safety code compliance. The building does not meet modern fire/life safety regulatory codes or seismic requirements, and to upgrade it with fire proofing, fire separations and structural enhancements would prove to be cost prohibitive. Compared with new construction, costs per square foot for building-wide renovation, including complete rebuilding of heating, ventilation and air conditioning, electrical, communication and plumbing systems would likely be greater, while the quality and configuration of the resulting space would be less desirable and inefficient for modern laboratory or office uses.

Finally, this alternative would not meet the other objectives of the proposed project, such as helping to meet the DOE policy requiring that the square footage of new construction at a DOE facility be balanced by elimination of an equivalent amount of excess space.

Encasing the Facility as a Central Courtyard Feature for Future Development at the Site

Under this alternative, which was suggested by members of the public, the Bevatron and Building 51 would be enclosed within a new building superstructure and utilized as a central design feature for any future development that may occur at the project site. This alternative is essentially another version of a preservation alternative, and would have similar advantages in avoiding significant impacts to cultural resources, and similar disadvantages in requiring major upgrades to the building and in not fulfilling the objectives of the proposed project. Also, this alternative would entail significant additional costs in creating the new building superstructure.

CHAPTER VI
CEQA Considerations

A. Introduction

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

B. Significant, Unavoidable Effects

CEQA Guidelines 21100(b)(2) and 15126.2(b) require that any significant and unavoidable effect on the environment must be identified. In addition, CEQA Guidelines 15093(a) allows the decision-making agency to determine if the benefits of a proposed project outweigh the unavoidable adverse environmental impacts of implementing the project. The Lead Agency can approve a project with unavoidable adverse impacts if it prepares and adopts a "Statement of Overriding Considerations" setting forth the specific reasons for making such a judgment. A list of unavoidable adverse impacts identified in this EIR is provided below. For each of the unavoidable adverse impacts, a Statement of Overriding Considerations must be prepared and approved if the project is adopted.

Section IV.D, Cultural Resources, identified significant and unavoidable impacts to historic resources which would result from demolition of Building 51 and the Bevatron. While the Historic American Building Survey (HABS) documentation described in Section IV.D would lessen this significant impact, the historic resource cannot be replaced, and the project impact to historic resources would remain significant and unavoidable.

For all other environmental resources, with incorporation of 1987 LRDP, as amended, mitigation measures and project-specific mitigation measures, all other impacts identified in the EIR would be less than significant.

C. Significant Irreversible Environmental Changes

CEQA Guidelines Section 15126.2(c) requires a discussion of any significant irreversible environmental changes that would be caused by the proposed project should it be implemented. The proposed project does not commit the site to any particular future use. The proposed project would not result in any significant irreversible environmental changes except for the historic resources impacts discussed above.

D. Growth Inducement

Projects are typically considered growth-inducing if they foster economic or population growth. Typical growth inducers might be the extension of urban services or transportation infrastructure to previously un-served or under-served areas, or the removal of other major barriers to development.

The project would not result in any permanent employment growth at LBNL, nor would it foster an increase in population in the project vicinity. The project would not provide major new infrastructure that could serve to induce additional growth, either at LBNL or in the area. Rather, the project would demolish a building whose current employees would be relocated to other buildings at LBNL. The project would be implemented within the existing LBNL grounds, in an area connected to all necessary urban services. No new roadways would be constructed. The project would be consistent with the existing LBNL Long-Range Development Plan. In light of the above, the proposed project would not have the capacity to induce growth.

As stated in the Project Description, removal of Building 51 and its contents would free up the site for future development. However, while development of the site is likely at some point in the future, at this time, there are no firm plans for such development that have reached the level of a proposed or reasonably foreseeable action. Given the absence of a development proposal, and given that the new LRDP and LRDP EIR now under preparation are not anticipated to include any specific development proposal for the Building 51 site, it would be speculative at this time to provide detailed analysis. However, it is anticipated that future development would be consistent with the 1987 LRDP and 1987 LRDP EIR, as amended, or, depending on when development would be proposed, with the new LRDP and LRDP EIR. Future development would be evaluated and documented in accordance with CEQA requirements, and would incorporate applicable mitigation measures. A future project also would comply with applicable governmental requirements that result in the avoidance or reduction of potential environmental impacts. Any such project would be required to be consistent with the governing LRDP absent an LRDP amendment.

E. Cumulative Impacts

The California Environmental Quality Act (CEQA) defines cumulative impacts as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The cumulative impact 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.

Regarding a potential future project at the site, the same considerations apply as discussed above under Growth Inducement. Future development at the site would contribute to cumulative

impacts that would be greater than those analyzed in this EIR. However, as explained in the cumulative impacts discussions that follow the project-specific impacts analyses in this EIR, it is expected that any future project at the site of the proposed project will not contribute considerably to a significant cumulative impact. All future development at LBNL will be consistent with the 1987 LRDP and LRDP EIR, as amended, or with the new LBNL Long Range Development Plan and its accompanying LRDP EIR currently under preparation, and would incorporate any relevant mitigation measures. Implementation of either LRDP in conjunction with other projects anticipated by the City of Berkeley's General Plan and by UC Berkeley's LRDP is not anticipated to result in any cumulatively significant impact.

Projects Included in the Cumulative Impact Analysis

The proposed project has been compared to the projected development in the area for analysis of cumulative impacts. Planned, pending, and/or reasonably foreseeable projects in the area of the proposed project include the following:

Rehabilitation of Buildings 77 and 77A

The Rehabilitation of Buildings 77 and 77A project has already been approved to replace the roof of Building 77; upgrade various utility systems in both buildings (e.g., heating, ventilating, and air conditioning systems in Building 77A); add an interior crane to Building 77A; and construct a small nearby building to house chillers, a cooling tower, boilers, and associated equipment (e.g., pumps, piping, and controls).

Resource Conservation and Recovery Act (RCRA) Corrective Measures Implementation (CMI)

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. The investigation and cleanup process consists of multiple steps, many of which have already been completed. The areas that need to be addressed have been identified and investigated. Cleanup activities have already been conducted in some areas as part of Interim Corrective Measures (ICMs) 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, has been made available to the public and other agencies for their review and comment.

DTSC is currently considering approval of the CMS Report. If DTSC approves the CMS Report, the selected cleanup measures would be put in place as part of the Corrective Measures Implementation (CMI) phase of the Project. CEQA coverage has been provided by an Initial Study/Negative Declaration tiered from the 1987 LRDP EIR, as amended (DTSC, 2005).

Construction and Operation of an Animal Care Facility

The Animal Care Facility would be an approximately 7,100 gross square foot (gsf) one-story building that would be located on the eastern side of Berkeley Lab, 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. The 5,000 mice and 20 rats in Building 74 would be transferred to the new facility, which would have the capacity to hold 8,000 mice (although it may never reach that level of use), and 20 rats. The animals are laboratory animals bred for research purposes. They would continue to be used for the same types of life sciences research that the present animal colony serves, including the biology of breast cancer-related genes, the role of cellular environment in cancer development, the molecular mechanisms of DNA repair caused by external factors, and the biology of red blood cell formation. 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 these 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. Construction activities would take place for a roughly one-year period, forecast at this time to occur between April 2006 and April 2007.

Blackberry Gate Security Upgrades

An approximately 140' x 20' section of Cyclotron Road, the main road leading into Berkeley Lab from Hearst Avenue in Berkeley, California, would be widened to provide a visitor processing lane. The lane would be used to hold visitor vehicles while security personnel perform the procedures necessary to admit each visitor to the Lab. The lane might also be used to temporarily park large trucks while they wait for LBNL escort vehicles. The action would also include removing the existing guard kiosk and installing up to three new guard kiosks. The project likely would begin in January and last through August 2006.

UC Berkeley 2020 LRDP

The UC Berkeley 2020 LRDP and LRDP EIR project population increases of up to 12 percent (approximately 5,320 “heads”) and in built space by 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 2020 LRDP EIR also included a project-level analysis of the Chang-Lin Tien Center for East Asian Studies. The proposed Center includes two buildings: Phase 1, a four-story building of approximately 67,500 gsf, and Phase 2, a building planned to accommodate up to 43,000 gsf. The

Phase 1 building would house the East Asian Library, while the Phase 2 building would house the Institute of East Asian Studies and the Department of East Asian Languages and Culture. The Tien Center buildings are proposed for construction along the southern and western perimeter of Observatory Hill (UC Berkeley, 2004). At this point in time, Phase 1 is the only project that has received funding to proceed. Construction for Phase 1 is scheduled to begin in August and continue for approximately 18 months through February 2007 (Shaff, 2005).

UC Berkeley Projects

Early Childhood Education Center

On April 14, 2005, UC Berkeley issued a Notice of Intent to Adopt a Mitigated Negative Declaration for its proposed Early Childhood Education Center. UC Berkeley proposes to construct and operate an Early Childhood Education Center, serving up to 78 children, on the north side of Haste Street, mid-block between Dana and Ellsworth Streets, in Berkeley, California. The 17,880 square foot project site is adjacent to a large campus parking lot. The project site itself is presently used as a surface parking lot with 53 marked vehicle spaces (UC Berkeley, 2005a). Construction is scheduled to begin in August 2005 and end by August 2006 (Shaff, 2005).

Stanley Biosciences and Bioengineering Facility

As part of UC Berkeley's Northeast Quadrant Science and Safety (NEQSS) Projects, described in the NEQSS EIR (UC Berkeley, 2001), demolition of the former Stanley Hall took place in Spring 2003. The new Stanley Hall is currently under construction and is scheduled to be completed in mid-2006. The new facility will be located at the East Gate of the campus next to the Hearst Memorial Mining Building. The building will be eight stories above ground with three basement levels, and will measure approximately 285,000 gross square feet. Approximately 42 percent of the building will be research laboratories and direct lab support areas, 33 percent will be specialized laboratory facilities serving faculty, students and staff who are part of the California Institute for Quantitative Biomedical Research and the Center for Information Technology Research (two of the California Institutes for Science and Innovation that will be housed in the building), and 25 percent will be office, meeting, and instructional facilities (UC Berkeley, 2005b).

Center for Information Technology Research in the Interest of Society (CITRIS) Headquarters/Davis Hall North Replacement Project

The Center for Information Technology Research in the Interest of Society (CITRIS) Headquarters project is part of UC Berkeley's NEQSS projects. The demolition of Davis Hall North, located in the north east section of the Berkeley campus near the intersection of Hearst and LeRoy Avenues, began at the end of August 2004 to make way for a state-of-the-art replacement facility that will provide the headquarters for CITRIS. The project will replace the existing Davis Hall North building, and is designed to contain about 79,420 assignable square feet within a total area of 142,000 gross square feet. Major building components of this research and teaching facility include flexible dry laboratory space, distance learning classrooms, and an auditorium,

multi-media center, and office and administrative space (UCOP, 2002). Construction hours are 7:00 a.m. to 7:00 p.m. on weekdays. Construction of the new CITRIS Headquarters facility is expected to continue through 2007 (UC Berkeley, 2005b).

Bancroft Library

UC Berkeley plans to 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. The project will also include some program improvements. Construction for this project is expected to begin in December 2005 and continue for approximately 18 months through June 2007 (Shaff, 2005).

UC Berkeley Pedestrian Bridge

UC Berkeley plans to construct an Americans with Disabilities Act-compliant pedestrian bridge to connect the north and south components of the Foothill housing project. As currently proposed, the pedestrian bridge would be constructed over Hearst Avenue, just east of Gayley Road, connecting the two sides of the Foothill dormitories and would provide access between the dormitories and campus.

City of Berkeley General Plan

Development in the surrounding area includes growth and development within the city of Berkeley as envisioned in the 2001 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.

Projects Not Included in the Cumulative Impact Analysis

2006 LBNL LRDP

Although not yet completed or approved, an update to the 1987 LRDP is currently in progress. In November 2000, a Notice of Preparation was issued for this forthcoming LRDP and new LRDP EIR, which was updated in October 2003. This LRDP would project growth and development at LBNL for approximately the next twenty years. LBNL expects to circulate the draft LRDP and new LRDP EIR for public review in 2006. The proposed new LRDP will identify new population and space growth projections for LBNL. Growth will be projected to occur at approximately the same rate as has been experienced at LBNL during its recent history (approximately 1.3 percent per year). Because there is still capacity for growth in space and population in the current LRDP, the main differences between the current LRDP and the upcoming proposed new LRDP would be realized during the middle and later phases of the planning period, sometime after 2008. The proposed Building 51 demolition project and any other existing on-going projects at the Lab would be reflected and accounted for in the new LRDP and new LRDP EIR.

Building 49

The *Construction and Operation of the Building 49 Project Final Environmental Impact Report* was issued in December 2003 (SCH No. 2003062097). No decision to initiate this project has been made, and there are no plans at the present time for it to move forward. The project has not been funded and at present, no alternative funding source is foreseen. It is not reasonably foreseeable that the Building 49 project would commence during the Building 51 and Bevatron demolition project. Therefore, this project has not been included for cumulative impacts assessment purposes. If this project were to be revived, its existing EIR would be reviewed as per CEQA Guidelines section 15162 to determine its adequacy, and additional documentation (e.g., an addendum, supplement, or subsequent EIR) would be prepared if necessary.

Molecular Foundry Building

The *Final Tiered Initial Study Checklist and Mitigated Negative Declaration for the Construction and Operation of the Molecular Foundry* was issued in April 2003 (SCH No. 2002122051). Construction operations and attendant impacts for this project are expected to be completed by December 2005 or January 2006, prior to the start of physical impacts from the Building 51 and Bevatron demolition project, which would not start until February or March 2006. Therefore, this project has not been considered for cumulative impacts assessment purposes.

UC Berkeley Memorial Stadium Upgrade Project

According to UC Berkeley Facilities Services, no detailed information about this project is available. While it is tentatively anticipated that some construction activity associated with this project would occur, because details are not available, it would be speculative to evaluate this project. At the time that a specific project is proposed for the stadium, environmental review would be conducted by UC Berkeley.

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CHAPTER VII
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CHAPTER X
Acronyms

ABAG	Association of Bay Area Governments
ACCWP	Alameda Countywide Clean Water Program
ACM	Asbestos-containing materials
ASL	Advanced Light Source
AST	Aboveground storage tank
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BMPs	Best Management Practices
Cal/EPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CAP	Clean Air Plan
CARB	California Air Resources Board
CBC	California Building Code
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
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

CMI	Corrective Measures Implementation
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CUPA	Certified Unified Program Agency
CVC	California Vehicle Code
CWA	Clean Water Act
CY	Calendar year
dB	Decibels
dBA	A-weighted decibels
DCE	1,1-dichloroethene
DOE	United States Department of Energy
DOT	United States Department of Transportation
DPM	Diesel particulate matter
DTSC	Department of Toxic Substances Control
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Park District
EH&S	Environment, Health, and Safety (Division)
EIR	Environmental Impact Report
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
gpd	Gallons per day
gsf	Gross square feet

HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HEPA filter	High Efficiency Particulate Air filters
HWHF	Hazardous Waste Handing Facility
Hz	Hertz
ICM	Interim Corrective Measures
kv	Kilovolt
Leq	Energy-Equivalent Noise Level
LBL/LBNL	Lawrence Berkeley Laboratory/Lawrence Berkeley National Laboratory
LHS	UC Berkeley Lawrence Hall of Science Museum
LLNL	Lawrence Livermore National Laboratory
LOS	Level of Service
LRDP	Long Range Development Plan
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
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Airborne Pollutants
NHPA	National Historic Preservation Act
NOI	Notice of Intent
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
OSHA	Occupational Health and Safety Administration
PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PG&E	Pacific Gas & Electric Company
$PM_{2.5}$	Particulate Matter – 2.5 microns or smaller
PM_{10}	Particulate Matter – 10 microns or smaller
ppm	Parts per million
PNNL	Pacific Northwest National Laboratory
PRC	Public Resources Code
psi	Pounds per square inch
RCRA	Resource Conservation and Recovery Act
ROG	Reactive Organic Gas
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SEIR	Supplemental Environmental Impact Report
SHM	Seismic Hazards Mapping
SHPO	State Historical Preservation Officer
SIP	State Implementation Plan
SLAC	Stanford Linear Accelerator Center
SMARA	Surface Mining and Reclamation Act
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
TCE	Trichloroethene
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
UC	University of California
UCPD	UC Berkeley Police Department
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground storage tank
VOC	Volatile organic compound
$\mu g/m^3$	Micrograms per cubic meter