University of California, Berkeley

Heathcock Hall Building Project

Addendum Number 4 to the UC Berkeley 2021 Long Range Development Plan and Housing Projects #1 and #2 Environmental Impact Report

State Clearinghouse Number 2020040078

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Prepared by:

University of California, Berkeley
Capital Strategies
Physical and Environmental Planning
200 A&E Building
Berkeley, CA 94720-1382

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1. Project Information

Project Title:	Heathcock Hall Building Project
Location:	University of California, Berkeley Alameda County
LRDP Planning Zone:	Campus Park
Lead Agency:	The Regents of the University of California 1111 Franklin Street, 12th Floor Oakland, CA 94607
Contact Person:	Raphael Breines, Senior Planner University of California, Berkeley Physical & Environmental Planning rbreines@berkeley.edu
Project Sponsor:	University of California, Berkeley Capital Strategies Physical and Environmental Planning 200 A&E Building Berkeley, CA 94720-1382
Certified 2021 LRDP Program EIR:	This Addendum documents that none of the conditions described in CEQA Guidelines Section 15162 have occurred and that the Proposed Project will not have any significant effects that were not already disclosed, analyzed and mitigated, as necessary, in the 2021 LRDP EIR (State Clearinghouse No. 2020040078). The 2021 LRDP is a comprehensive land use plan that guides physical development on the UC Berkeley campus to accommodate projected UC Berkeley population increases and expanded and new program initiatives. The 2021 LRDP and associated EIR are available for review at https://lrdp.berkeley.edu.

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2. Introduction

2.1 BACKGROUND, PURPOSE, AND PROJECT OVERVIEW

The University of California (UC) Berkeley 2021 Long Range Development Plan (2021 LRDP) is a comprehensive long-range land use plan that guides physical development on the UC Berkeley campus consistent with UC Berkeley's mission, priorities, strategic goals, and campus population projections through the 2036-37 academic year. On July 22, 2021, the UC Board of Regents (the Regents) certified the 2021 LRDP environmental impact report (2021 LRDP EIR), State Clearinghouse No. 2020040078, and approved the 2021 LRDP. The 2021 LRDP EIR provides a program-level analysis of the overall proposed development and campus population projections in the 2021 LRDP (up to 8,096,249 square feet of new building space for residential, academic life, campus life, and parking facilities and 11,731 new beds), as well as a project-level analysis for two student housing projects. The two student housing projects were approved by the Regents on July 22, 2021, and September 30, 2021, respectively.

The proposed Heathcock Hall Building Project (Proposed Project), a six-story, approximately 81,700-gross-square-foot academic building located within the Campus Park, was identified and analyzed in the 2021 LRDP EIR and is consistent with the land uses and intensities of development contemplated in the 2021 LRDP, which prioritizes development sites on the Campus Park for academic and research space. The Proposed Project would provide space to accommodate the College of Chemistry's research and teaching mission and it would allow for selective decommissioning of other existing chemistry labs that no longer meet research needs or those requiring seismic improvement and/or renewal and restoration.

This Addendum uses a checklist format to document that project-specific activities are covered by the 2021 LRDP EIR pursuant to CEQA Guidelines Section 15168(c), which states that subsequent activities in a program, "must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared." This Addendum and attached supporting documents have been prepared to document that the Proposed Project is consistent with the 2021 LRDP and that its potential environmental impacts are within the scope of those addressed in the 2021 LRDP EIR, pursuant to CEQA Guidelines Section 15168. This Addendum also documents that none of the conditions described in CEQA Section 21166 or CEQA Guidelines Sections 15162 or 15164 calling for preparation of a subsequent or supplemental EIR have occurred. Pursuant to the provisions of CEQA and the CEQA Guidelines, the Regents, acting as the lead agency, are charged with the responsibility of deciding whether or not to approve the proposed action.

2.2 ENVIRONMENTAL PROCEDURES

Pursuant to CEQA Section 21166 and CEQA Guidelines Section 15162, when an EIR has been certified or a negative declaration adopted for a project, no subsequent EIR or negative declaration shall be prepared for the project unless the lead agency determines that one or more of the following conditions are met:

- Substantial project changes are proposed that will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
- Substantial changes would occur with respect to the circumstances under which the project is undertaken that require major revisions to the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
- New information of substantial importance that was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified or the negative declaration was adopted shows any of the following:
    - The project will have one or more significant effects not discussed in the previous EIR or negative declaration.
    - Significant effects previously examined will be substantially more severe than identified in the previous EIR.
    - Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponent declines to adopt the mitigation measures or alternatives.
    - Mitigation measures or alternatives that are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponent declines to adopt the mitigation measures or alternatives.

Where none of the conditions specified in Section 15162[1] are present, the lead agency must determine whether to prepare an Addendum or whether no further CEQA documentation is required (CEQA Guidelines Section 15162[b]). An Addendum is appropriate where some minor technical changes or additions to the 2021 LRDP or the previously certified EIR are necessary, but there are no new or substantially more severe significant impacts (CEQA Guidelines Section 15164).

In accordance with the CEQA Guidelines, as demonstrated in Section 3, *Project Description*, and Section 5, *Environmental Analysis*, UC Berkeley has determined that an Addendum to the 2021 LRDP EIR is appropriate for the Proposed Project.

[1] See also Section 15163 of the State CEQA Guidelines, which applies the requirements of Section 15162 to supplemental EIRs.

3. Project Description

3.1 LOCATION AND SETTING

The site for the Proposed Project is in the city of Berkeley in Alameda County. The site is part of the UC Berkeley campus, which is organized into five zones—the Campus Park, Hill Campus West, Hill Campus East, Clark Kerr Campus, and the City Environs Properties. The site is in the Campus Park. Major regional roadways serving the UC Berkeley campus include Interstate 580, State Route 13, and State Route 24. Gayley Road is the main local roadway serving the project site. Figure 1, *2021 LRDP EIR Study Area*, provides a regional location map.

The one-and-a-half-acre project site is located in the northeast quadrant of the UC Berkeley Campus Park along University Drive at its intersection with Gayley Road adjacent to the primary facilities associated with the College of Chemistry. The project site is generally a steep, undeveloped hillside bounded by University Drive to the north; Gayley Road to the east; Lewis Hall to the south; and Latimer Hall and Pimentel Hall to the west. Figure 2, *Site Plan and Surroundings*, shows the site plan for the Proposed Project and vicinity.

3.2 PROPOSED PROJECT

The Proposed Project would provide a new, approximately 81,700-gross-square-foot (GSF), academic building, known as Heathcock Hall, that includes 49,300 assignable square feet. The building would provide a mix of flexible and operationally resilient laboratories, associated non-lab workspace, office space, and other support and collaboration meeting spaces. The building would house researchers, faculty, and students across multiple disciplines affiliated with the College of Chemistry. The Proposed Project would not result in student or employment population growth because the new building would house existing College of Chemistry departments.

The Proposed Project would include six floors and a partial plate basement. The lowest two floors would be partially below-ground because of the site's unique topography. Mechanical systems would be located on the roof. At its northwest corner, the top of the building's parapet would be approximately 95 feet above grade; on its east side, at Gayley Road, the top of the building's parapet would rise approximately 85 feet above the sidewalk. To enable construction, an existing connecting structure between Latimer and Lewis halls would be demolished and replaced with new connections to these adjacent buildings. The new building's primary entrance would be located on the west side and connect to the existing outdoor plaza between Latimer Hall and Pimentel Hall. A secondary entrance would be located on the east side of the building and connect to Gayley Road. The building facade would be a mix of vision glass, etched or back-painted spandrel glass, precast concrete or glass-fiber reinforced concrete, and terracotta, and designed to provide a high degree of energy efficiency.

Heathcock Hall would provide space for permanent occupancy of approximately 315 faculty, students, researchers, and staff in flexible laboratories and learning facilities. Peak daily building occupancy would be

approximately 315 people. The Proposed Project would provide racks for 48 bicycles, both interior and exterior; a portion of these racks would be located within the Latimer Hall basement, which is connected to the new building's elevators.

Delivery access to the building would be via the existing College of Chemistry loading dock located along South Drive. As part of the Proposed Project, the intersection of Gayley Road and University Drive would be reconstructed to: 1) provide additional setbacks for the building; 2) address local accessibility issues created by existing topography; 3) address pedestrian safety and improve sidewalks; and 4) improve landscaping, lighting, and paving. The existing AC Transit bus stop and shelter located on Gayley Road would be improved and located in a similar location. Accessible parking and an accessible route to the building across Gayley Road would be constructed to support Heathcock Hall and campus-wide accessibility needs. The Proposed Project would include two ADA-compliant parking spaces across Gayley Road adjacent to Substation #6. The Proposed Project would also include accessible path of travel improvements from this new parking area, along and across Gayley Road, to the third floor of the new building via a bridge from Gayley Road.

Construction of the Proposed Project is anticipated to last 34 months. During construction, direct access to Latimer Hall would be maintained. During construction access along Gayley Road may be periodically disrupted. Two potential crane locations have been identified: within the building elevator/mechanical shaft or at the southwest corner of Gayley Road and University Drive. Temporary storage of construction materials and equipment would occur in a roughly 0.2-acre total area comprising two locations: 1) east of the Campus Park across Gayley Road and 2) west of Evans Hall, west of the project site.

The building footprint would be designed to be set back 27 feet at the narrowest point and 73 feet at the widest point from Gayley Road. Up to 45 trees would be removed for development and 19 new trees would be planted. The Proposed Project would be designed to reinforce the eastern edge of the Campus Park. The landscape would include a mix of native and locally adapted, drought-tolerant grasses and trees. Pedestrian pathways through the project site would also be improved to meet UC Berkeley mobility and accessibility needs. The Proposed Project would also participate in a campus-wide stormwater management system.

The Proposed Project would comply with the University of California Sustainable Practices Policy. The Proposed Project is designed to achieve or exceed the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED)™ Silver certification and will strive to meet LEED™ Gold certification. Heathcock Hall would be designed for several different operational modes for energy use. The building will be integrated with the campus Electrical Heating and Cooling Plant (EHCP) currently being planned as part of the Clean Energy Campus project. However, the building will be constructed with its own rooftop chiller for cooling and initially connect to the existing campus cogeneration steam loop for heating. As the campus's EHCP becomes operational, a cooling loop will be constructed that will connect to Heathcock Hall and other buildings. Subsequently, when the EHCP is fully operational, this smaller cooling loop will be decommissioned and replaced by the EHCP. Additionally, Heathcock Hall will provide a heat recovery system that will capture and recycle the embodied energy of the exhaust air leaving the building to minimize building energy use; the heat recovery system would subsequently be rerouted to connect to the ECHP, providing greater overall campus energy efficiency. An exterior generator would be located in the project site.

The building's design would incorporate recessed energy-efficient glazing with limited southern exposure to reduce glare and solar heat gain, efficient mechanical systems including heat recovery for energy reduction, drought tolerant planting, and outdoor bicycle parking. Bird safety measures would include low-reflectivity glass, avoidance of free-standing glass elements, exterior light pollution control, and interior lighting shutoffs during nighttime hours. Figure 3, *View from the Northeast*, Figure 4, *View from the East*, and Figure 5, *View from the Southeast*, provide renderings of the Proposed Project.

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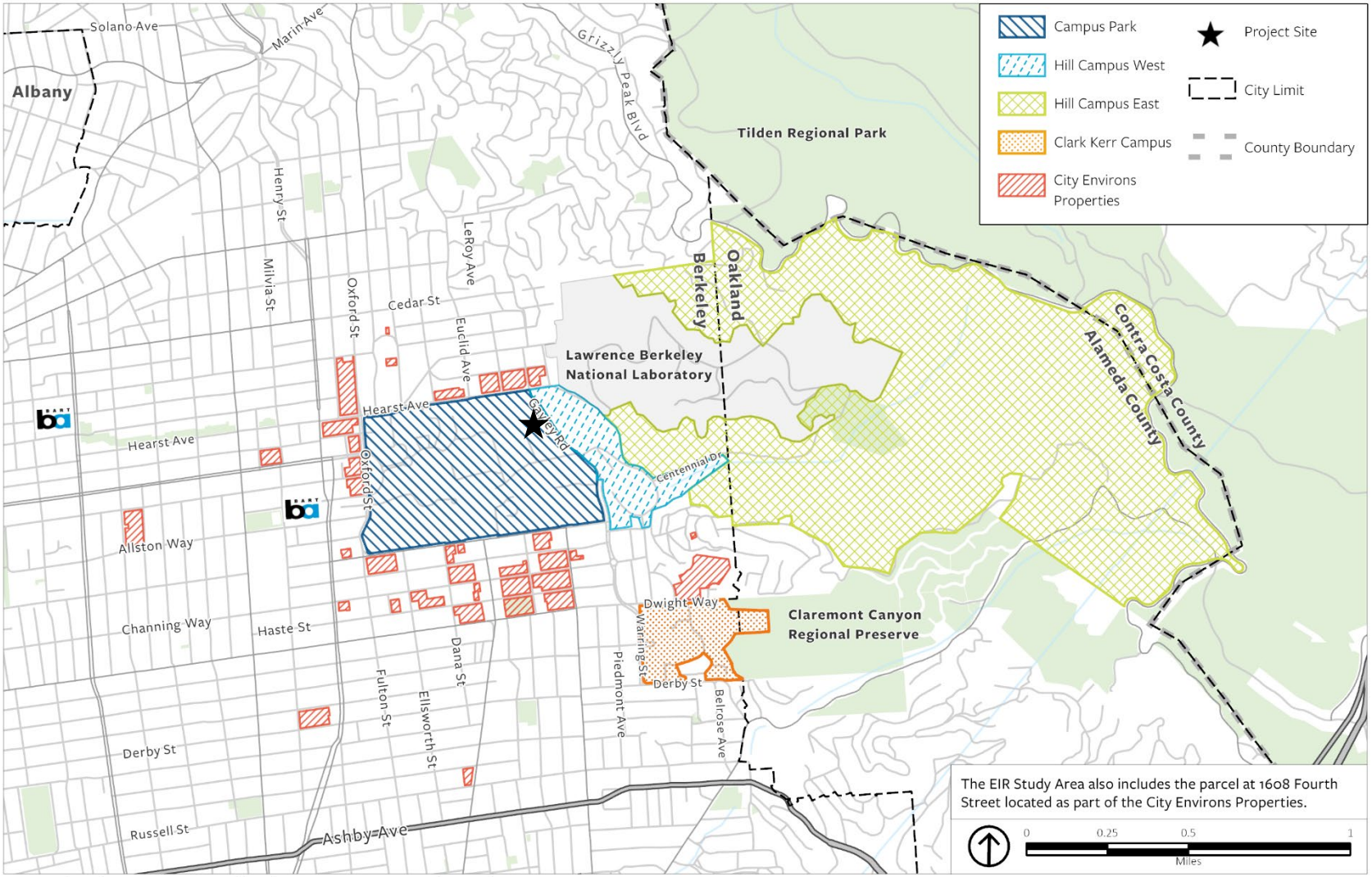
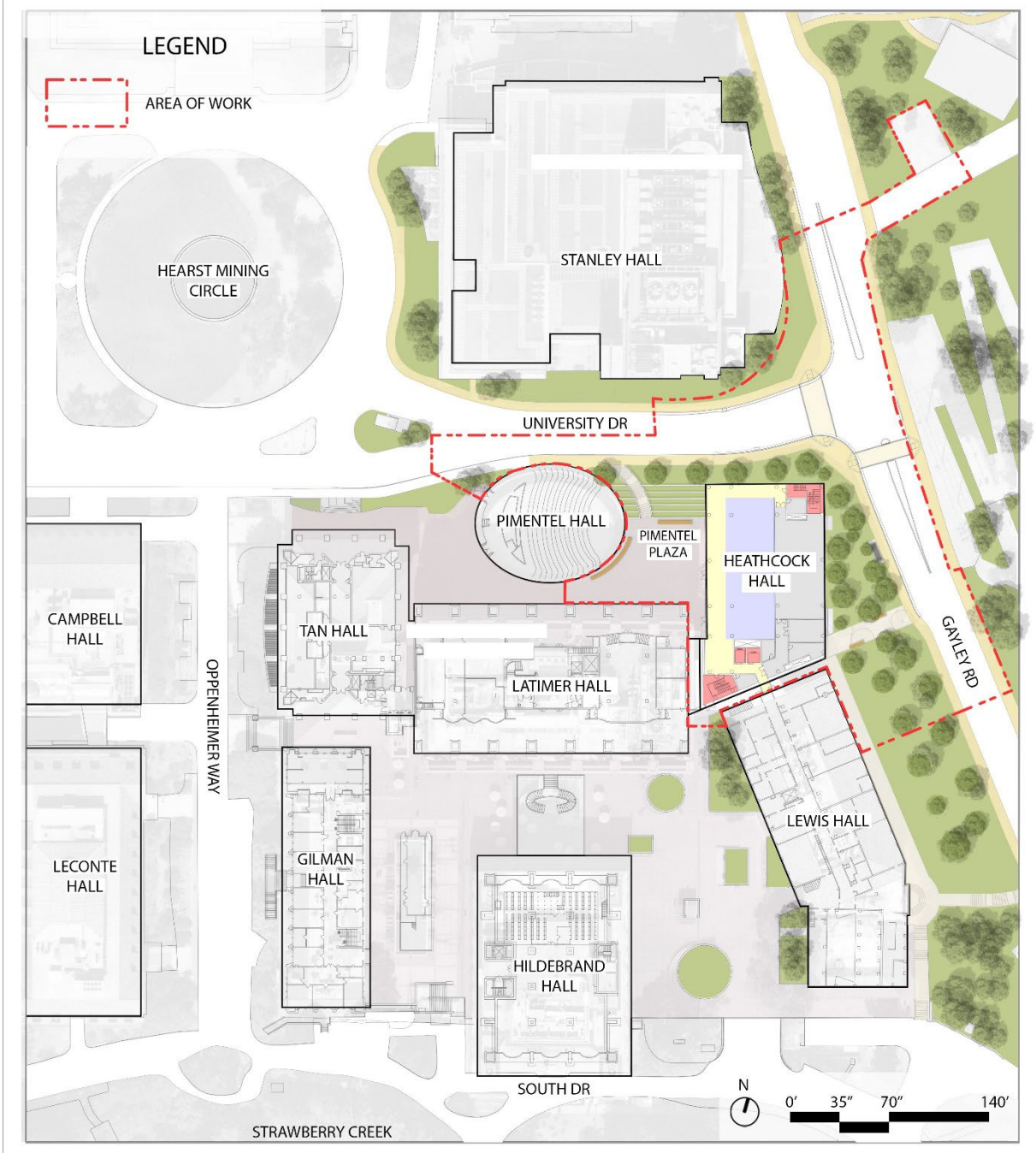
Figure 1 2021 LRDP EIR Study Area



Source: Alameda County, 2019; Sasaki and Page, 2019; ESRI, 2020; PlaceWorks, 20

Figure 2 Site Plan and Surroundings



Source: HOK, 2023.

Figure 3 View from the Northeast

Source: HOK, 2023.

Figure 4 View from the East

Source: HOK, 2023.

Figure 5 View from the Southeast

Source: HOK, 2023.

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4. Coverage under the 2021 LRDP EIR

To determine the Proposed Project's coverage under the 2021 LRDP EIR, this section addresses the following questions:

1. Is the Proposed Project consistent with the project objectives contained in the 2021 LRDP EIR?
2. Is the Proposed Project consistent with the UC Berkeley land uses evaluated in the 2021 LRDP EIR for the project area?
3. Is the amount of development associated with the Proposed Project within the development program in the 2021 LRDP EIR?
4. Have the conditions described in CEQA Guidelines Section 15162 calling for the preparation of a subsequent EIR occurred?

Questions one through three are addressed in the remainder of this section and question four is addressed in Section 5, *Environmental Analysis*. Section 5 contains a detailed analysis of the Proposed Project's potential environmental impacts and determines that none of the conditions in CEQA Guidelines Section 15162 calling for the preparation of a subsequent EIR have occurred.

4.1 OBJECTIVES CONSISTENCY

The 2021 LRDP EIR contains the following objectives relevant to the Proposed Project.

- Maintain the Campus Park as the central location for academic life, research, and student life uses as well as student services, and provide a range of adaptable and multipurpose spaces required to promote excellence and leadership in teaching, research, and public service consistent with UC Berkeley's mission and Strategic Plan. Prioritize administrative and student life facilities in locations adjacent to but off of the Campus Park.
- Maintain natural areas as well as generous natural and built open spaces on the Campus Park and the Clark Kerr Campus.
- Plan every new project (i.e., renovation, strategic infill/ additions, and new construction) to support the optimal investment of resources, meet space needs and improve space utilization, and address deferred maintenance.
- Take advantage of UC Berkeley's urban location to prioritize mobility system improvements that promote an accessible, efficient, sustainable, and safe campus.
- Minimize private vehicle access in the Campus Park and prioritize transit, bicycle, and pedestrian access to and across the Campus Park to decrease carbon emissions, congestion, and parking demand.
- Prioritize improvements and create clearly defined routes for bicycle, pedestrian, transit, and micromobility networks to enhance UC Berkeley campus connectivity and safety, to make navigation more intuitive and inclusive, and to ensure access to the campus by all UC Berkeley constituents.

- Maintain and enhance the image and experience of the UC Berkeley campus and support the continuing evolution of UC Berkeley campus's notable and historic landscapes and architecture.
- Maintain, support, and enhance UC Berkeley's status as an internationally renowned, 21st-century, public research-intensive university and center for scientific and academic advancement by expanding its graduate and professional schools, policy institutes, research programs, laboratories, and institutions.

The Proposed Project would support these objectives as follows:

- The Proposed Project would create a new academic building within the Campus Park.
- The Proposed Project would provide a mix of flexible and operationally resilient laboratories, associated non-lab workspace, office space, and other support and collaboration meeting spaces. The building would house researchers, faculty, and students across multiple disciplines affiliated with the College of Chemistry.
- The Proposed Project would make the highest and best use of limited land resources by prioritizing utilization of an undeveloped site for facility development to accommodate program needs, taking into consideration site setting and context, adjacent uses, and coordination with existing landscape, infrastructure, and mobility systems.
- The Proposed Project is located in the northeast quadrant of the Campus Park and has been designed to reinforce the eastern edge of the Campus Park. Moreover, the Proposed Project would improve the existing plaza at the entrance to Latimer Hall and Pimental Hall and create an active and welcoming public entrance to the College of Chemistry complex.
- The Proposed Project has been designed to improve adjacent pedestrian pathways and outdoor bike parking, and bus stop on Gayley Road, to meet UC Berkeley campus mobility and accessibility needs.

4.2 UC BERKELEY LAND USE CONSISTENCY

The 2021 LRDP organizes UC Berkeley campus land uses into the following categories: residential, academic life, campus life, parking, and open space. The 2021 LRDP EIR identifies that the highest priority needs for academic life space are classrooms and study space, followed by research space, and that academic life spaces under the 2021 LRDP will be primarily located within the Campus Park. The Proposed Project is therefore consistent with the land uses evaluated in the 2021 LRDP EIR.

4.3 DEVELOPMENT PROGRAM CONSISTENCY

The 2021 LRDP plans for up to 8,096,249 net new gross square feet (GSF) of residential, academic life, campus life, and parking facility space to be developed within the area governed by the 2021 LRDP, including up to 2,284,588 net new GSF of academic life space to be located primarily within the Campus Park. The Proposed Project would construct 81,700 GSF of academic life space in the UC Berkeley Campus Park.

Therefore, the Proposed Project would result in total development within levels anticipated in the 2021 LRDP EIR. The 2021 LRDP also projected a total UC Berkeley campus population of 67,200 students and employees. The Proposed Project would not result in student or employment population growth at UC Berkeley because the new building would house existing College of Chemistry departments. Therefore, the UC Berkeley campus population would remain within levels analyzed in the 2021 LRDP EIR.

With respect to site-specific projections, the Proposed Project was included in the 2021 LRDP EIR as a potential redevelopment project. Specifically, the Proposed Project was identified as project CP1 in the Campus Park and was conceptually planned for 143,000 square feet of academic life space in a building up to eight stories above grade. Table 1, *Comparison of 2021 LRDP EIR Buildout and Proposed Project*, compares the Proposed Project to project CP1 in the 2021 LRDP EIR. As shown in Table 1, the Proposed Project would have a reduced square footage and building height than was analyzed at the program level in the 2021 LRDP EIR.

TABLE 1 COMPARISON OF 2021 LRDP EIR BUILDOUT AND PROPOSED PROJECT

Project Description	2021 LRDP EIR Buildout	Proposed Project
Project Characteristics		
Type of Project	Redevelopment	Redevelopment
Uses	Academic Life	Academic Life, Campus Life
Project Dimensions		
Square Footage	143,000	81,700
Beds	0	0
Parking Spaces	0	2
Stories Above Grade	8	6

Note: All numbers represent total buildout numbers, not net new.
Source: UC Berkeley, 2022.

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5. Environmental Analysis

5.1 ENVIRONMENTAL EVALUATION OF THE PROPOSED PROJECT

This Addendum documents that the Proposed Project would not result in any new significant environmental impacts, an increase in the severity of significant impacts previously identified and studied in the 2021 LRDP and 2021 LRDP EIR, or require the adoption of any new or considerably different mitigation measures or alternatives. Accordingly, this Addendum is the appropriate form of environmental review for the Proposed Project. This Addendum has been prepared to satisfy the requirements of CEQA Guidelines Sections 15164(a), 15164(d), and 15164(e).

The sections below provide an evaluation of the environmental impacts of the Proposed Project and are organized to correspond with the standards of significance in the 2021 LRDP EIR, consistent with Appendix G, *Environmental Checklist Form*, of the CEQA Guidelines. Each section contains a summary of the findings of the evaluation, organized into the following columns:

- Level of Impact for the 2021 LRDP in the 2021 LRDP EIR presents the level of significance identified for the 2021 LRDP in the 2021 LRDP EIR, using the following acronyms:
  - NI = no impact. For these topics, there is no adverse effect on the environment.
  - LTS = less than significant. These effects are noticeable but do not exceed established or defined thresholds, and no mitigation is required.
  - LTS/M = less than significant with mitigation. For these circumstances, an established or defined threshold would be exceeded and a significant impact would occur; mitigation is required and would reduce the impact to a less-than-significant level.
  - SU = significant and unavoidable. For these topics, a significant impact would occur, and continuing best practices (CBPs) and/or feasible mitigation measures would not diminish these effects to less-than-significant levels.
- Environmental Effects of the Proposed Project presents the level of significance identified for the Proposed Project based on the evaluation in this Addendum, using the following categories:
  - New Less-than-Significant Impact. The Proposed Project would have a noticeable but less-than-significant effect on the environment that was not identified for the 2021 LRDP in the 2021 LRDP EIR.
  - Same Impact as 2021 LRDP. The Proposed Project would create the same level of impact identified for the 2021 LRDP in the 2021 LRDP EIR.
  - Less Impact than 2021 LRDP. The Proposed Project would create a noticeable effect on the environment, with a lesser level of impact than was identified for the 2021 LRDP in the 2021 LRDP EIR.
  - Topic Not Applicable to the Proposed Project. The Proposed Project would not have the potential to create an impact on an environmental topic that was evaluated in the 2021 LRDP EIR.

The Proposed Project is subject to all mitigation measures and CBPs in the 2021 LRDP EIR, as applicable. Please see Appendix A, *Applicable Program-Level Mitigation Measures and Continuing Best Practices*, of this Addendum.

5.1.1 AESTHETICS

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Determined to Have No Impact in the 2021 LRDP EIR					
Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	NI		X		
Topics Evaluated in the 2021 LRDP EIR					
AES-1: Have a substantial adverse effect on a scenic vista?	LTS		X		
AES-2: In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	LTS		X		
AES-3: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	LTS/M		X		
AES-4: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact?	LTS		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Determined to Have No Impact in the 2021 LRDP EIR

The topic of scenic highways has been screened out from further evaluation in this Addendum because the EIR Study Area is not on or within the viewshed of a State scenic highway.[2] Consequently, there would be no impacts to scenic highways. See Section 7.1.1, *Aesthetics*, of the 2021 LRDP EIR.

Topics Evaluated in the 2021 LRDP EIR

AES-1: The 2021 LRDP EIR identified a less-than-significant impact at the program level for the 2021 LRDP with respect to adverse effects on scenic vistas. Scenic vistas are limited to those accessible by the general public; within the EIR Study Area, these include views from fire roads and vehicle turnouts within the Hill Campus East, which provide views toward the San Francisco Bay from a higher elevation than the rest of the city of Berkeley. The project site is located in an urbanized part of the Campus Park. It is surrounded to the south and west by academic buildings, and by University Drive and Gayley Road to the north and east, respectively. The project site surroundings do not offer any scenic vistas. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

AES-2: The 2021 LRDP EIR identified a less-than-significant impact at the program level for the 2021 LRDP with respect to adverse effects on visual character of the site. The Proposed Project would result in adverse effects related to scenic quality if it were to conflict with applicable zoning or other regulations governing scenic quality. The Proposed Project conforms to the Physical Design Framework, consistent with CBP AES-1. The project has been designed with consideration to existing pathways and sightlines. The Proposed Project has been reviewed by UC Berkeley's Design Review Committee, and conforms to the project-specific design guidelines prepared by Physical & Environmental Planning, consistent with CBP AES-2. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

AES-3: The 2021 LRDP EIR identified a less-than-significant impact with mitigation at the program level for the 2021 LRDP with respect to new sources of substantial light or glare. The Proposed Project would result in an adverse effect if it created a new source of substantial light or glare which would adversely affect day or nighttime views in the area. The Proposed Project would comply with CBPs AES-6 and AES-7 to include shields and cut-offs that minimize light spillage onto unintended surfaces, minimize atmospheric light pollution, and minimize light and glare in exterior surfaces. The proposed building design includes low-reflectivity glass. Interior lighting would be controlled with an adjustable control system, and exterior lighting would be directed downward and screened. Limited exterior decorative lighting may be used, but would designed to minimize light escaping upwards. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant

[2] California Department of Transportation California Scenic Highways Program, Scenic Highway System Lists, List of eligible and officially designated State Scenic Highways, https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways, accessed February 28, 2020.

impact.

AES-4: The 2021 LRDP EIR identified a less-than-significant cumulative impact for the 2021 LRDP with respect to aesthetic impacts. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.2 AGRICULTURE AND FORESTRY RESOURCES

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Determined to Have No Impact in the 2021 LRDP EIR					
Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	NI		X		
Conflict with existing zoning for agricultural use, or a Williamson Act contract?	NI		X		
Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	NI		X		
Result in the loss of forest land or conversion of forest land to non-forest use?	NI		X		
Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	NI		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Determined to Have No Impact in the 2021 LRDP EIR

The 2021 LRDP EIR did not analyze impacts to agriculture and forestry resources because the EIR Study Area is primarily in an urbanized setting, and approval and implementation of the 2021 LRDP, including the

Proposed Project, would have no impact on agriculture and forestry resources. Accordingly, this issue is not discussed further in this Addendum. See Section 7.1.2, *Agricultural and Forestry Resources*, of the 2021 LRDP EIR.

5.1.3 AIR QUALITY

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Evaluated in the 2021 LRDP EIR					
AIR-1: Conflict with or obstruct implementation of the applicable air quality plan?	SU		X		
AIR-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	SU		X		
AIR-3: Expose sensitive receptors to substantial pollutant concentrations?	SU			X	
AIR-4: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	LTS		X		
AIR-5: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact.	LTS		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Evaluated in the 2021 LRDP EIR

AIR-1 and AIR-2: The 2021 LRDP EIR identified a significant and unavoidable impact at the program level regarding consistency with the Bay Area Air Quality Management District's *2017 Clean Air Plan: Spare the Air, Cool the Climate* (2017 Clean Air Plan) because the 2017 Clean Air Plan does not directly account for UC Berkeley's development program. Because the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR, the Proposed Project would not increase the development program analyzed in the 2021 LRDP EIR. The Proposed Project would provide a new building to house UC Berkeley's existing College of Chemistry departments and would not result in student population at UC Berkeley. Thus, the Proposed Project would not substantially affect housing, employment, or population projections in the region that are the basis of the 2017 Clean Air Plan projections.

The 2021 LRDP EIR identified significant and unavoidable impacts at the program level associated with the generation of fugitive dust, construction equipment exhaust, and reactive organic gases (ROG) emissions during construction and operation of development under the 2021 LRDP. The Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Construction and operation of the Proposed Project would result in criteria air pollutant emissions. As required by 2021 LRDP EIR Mitigation Measure AIR-2.1, off-road diesel-powered construction equipment with more than 50 horsepower used for the Proposed Project would meet the United States Environmental Protection Agency Tier 4 Final emissions standards or higher, where commercially available. In addition, as required by 2021 LRDP EIR Mitigation Measure AIR-2.2, interior architectural coatings used in the Proposed Project would be low volatile organic compound (VOC) or no-VOC paints. In addition, construction of the Proposed Project would adhere to CBP AIR-2 and CBP AIR-3, which require control measures for fugitive dust control and to reduce emissions of diesel particulate matter and ozone precursors. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

AIR-3: The 2021 LRDP EIR identified a significant and unavoidable impact at the program level associated with construction-related health risks. As required by Mitigation Measure AIR-3.1, a construction health risk assessment (HRA) has been prepared for the Proposed Project (see Appendix B, *Construction Health Risk Assessment*, of this Addendum). In addition, as described above, the Proposed Project would comply with Mitigation Measure AIR-2.1, which requires off-road diesel-powered construction equipment with more than 50 horsepower to meet the United States Environmental Protection Agency Tier 4 Final emissions standards or higher, where commercially available. The construction HRA found that, with implementation of Mitigation Measure AIR-2.1, the Proposed Project would not expose off-site sensitive receptors to substantial concentrations of air pollutant emissions during construction. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

AIR-4: The 2021 LRDP EIR identified a less-than-significant impact associated with the generation of substantial odors that would affect a substantial number of people. The type of facilities that are typically considered to have objectionable odors include wastewater treatment plants, compost facilities, landfills, solid waste transfer stations, fiberglass manufacturing facilities, paint/coating operations (e.g., auto body shops), dairy farms, petroleum refineries, asphalt batch plants, chemical manufacturing, and food manufacturing facilities. The Proposed Project's uses are not associated with foul odors that constitute a public nuisance. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

AIR-5: The 2021 LRDP EIR identified a less-than-significant cumulative impact for the 2021 LRDP with respect to toxic air contaminants. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.4 BIOLOGICAL RESOURCES

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Determined to Have No Impact in the 2021 LRDP EIR					
Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	NI		X		
Topics Evaluated in the 2021 LRDP EIR					
BIO-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	LTS		X		
BIO-2: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	LTS		X		
BIO-3: Have a substantial adverse effect on federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	LTS		X		
BIO-4: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	LTS/M		X		
BIO-5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	NI		X		
BIO-6: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact?	LTS		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Determined to Have No Impact in the 2021 LRDP EIR

Since the 2021 LRDP was approved and the EIR was certified, no local, regional, or State conservation plans have been approved that encompass the EIR Study Area, including the site of the Proposed Project. Accordingly, no further analysis regarding this standard of significance and the Proposed Project is required, and this issue is not discussed further in this Addendum. See Section 7.1.3, *Biological Resources*, of the 2021 LRDP EIR.

Topics Evaluated in the 2021 LRDP EIR

BIO-1 through BIO-3: The 2021 LRDP EIR identified less-than-significant impacts for the 2021 LRDP with respect to special-status plant species, riparian habitat or other sensitive natural communities, and federally protected wetlands. No special-status plant species, riparian habitat, other sensitive natural communities, or regulated waters occur within the project site due to the extent of past development and its location in an urbanized setting. Furthermore, the Proposed Project would adhere to CBP BIO-1 to avoid disturbance or removal of bird nests protected under the federal Migratory Bird Treaty Act and California Department of Fish and Game Code. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

BIO-4: The 2021 LRDP EIR identified a less-than-significant impact with mitigation concerning movement of wildlife species, wildlife corridors, and native wildlife nursery sites. Given the urbanized location of the Proposed Project, no adverse impacts on wildlife movement opportunities are anticipated. However, the new building proposed could pose the risk of bird collisions. As required by 2021 LRDP EIR Mitigation Measure BIO-4, the proposed building would be designed to minimize the potential risk of bird collisions. The building design includes low-reflectivity glass. Furthermore, the Proposed Project would not include any glass skyways or walkways or freestanding glass walls. Interior lighting would be controlled with an adjustable control system, and exterior lighting would be directed downward and designed to the extent possible to minimize light escaping upwards. However, limited exterior decorative lighting may be used, but would designed to minimize light escaping upwards. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

BIO-5: The 2021 LRDP EIR identified no conflict with any local policies or ordinances protecting biological resources. The Proposed Project would have no impact in the same regard because UC Berkeley is not subject to local regulations. Up to 45 trees would be removed for development and 19 new trees would be planted. As required by implementation of CBP BIO-9, the Proposed Project would comply with the Campus Specimen Tree Program and the Campus Design Standards, which protect sensitive habitat, trees, and waterways on the UC Berkeley campus. Specifically, implementation of CBP BIO-9 requires replacement landscaping where specimen resources are adversely affected, either through salvage and transplanting of existing trees or shrubs or through new horticulturally appropriate replacement plantings. The Proposed Project would not remove or affect any specimen trees. Furthermore, the Proposed Project would also adhere to CBP BIO-10 for the implementation of the recommendations of the Landscape Master Plan and

subsequent updates; project-specific design guidelines to improve the important open space characteristics and resilience of the Campus Park; and CBP BIO-11's requirement for routine maintenance of trees and other vegetation. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

BIO-6: The 2021 LRDP EIR identified a less-than-significant cumulative impact for the 2021 LRDP with respect to biological resources. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.5 CULTURAL RESOURCES

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Evaluated in the 2021 LRDP EIR					
CUL-1: Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	SU		X		
CUL-2: Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	LTS/M		X		
CUL-3: Disturb any human remains, including those interred outside of formal cemeteries?	LTS		X		
CUL-4: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact?	SU		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Evaluated in the 2021 LRDP EIR

CUL-1: The 2021 LRDP EIR identified a significant and unavoidable impact at the program level for the 2021 LRDP regarding substantial adverse change in the significance of a historical resource. Because of the programmatic nature of the 2021 LRDP, future projects could result in the demolition of one or more historical resources and/or modification of one or more historical resources in a manner not in conformance with the Secretary of the Interior's Standards for Rehabilitation. The project site is currently

vacant, but both adjacent Lewis Hall and Latimer Hall have been determined to be likely eligible for listing in a historical register. The Proposed Project would remove an existing connecting structure between Latimer and Lewis halls and replace it with new connections to these adjacent buildings. The connecting structure is not original to Lewis Hall and is not a character-defining feature of either building that make them eligible for listing in a historic register. UC Berkeley has determined that the proposed modifications to the connecting structure would preserve the historic fabric and features of both Lewis Hall and Latimer Hall, and will not result in a substantial adverse change to either building such that their historical significance would be impaired. Therefore, the Proposed Project would not cause a significant impact to a historic resource.[3] Furthermore, implementation of 2021 LRDP EIR Mitigation Measure CUL-1.1e would ensure that construction vibration does not negatively affect any nearby historic structures. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

CUL-2: The 2021 LRDP EIR identified a less-than-significant impact with mitigation concerning archaeological resources. The archaeological sensitivity analysis for the 2021 LRDP EIR identified 55 percent of the Campus Park as moderately to extremely sensitive.[4] However, the 2021 LRDP EIR identified the project site as having a low archaeological sensitivity. Nevertheless, soils beneath the project site could contain potentially significant prehistoric archaeological resources, which the Proposed Project has the potential to disturb. As required by 2021 LRDP EIR Mitigation Measure CUL-2, the Proposed Project would implement control measures during ground-disturbing activities to ensure that potential impacts to archaeological resources will be less than significant. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

CUL-3: The 2021 LRDP EIR identified a less-than-significant impact with respect to the disturbance of human remains. Though ground-disturbing activities, such as site grading and trenching for utilities, have the potential to disturb human remains interred outside of formal cemeteries, the Proposed Project would adhere to CBP CUL-1, under which any human remains encountered during ground-disturbing activities would be required to be treated in accordance with California Health and Safety Code Section 7050.5, Public Resources Code Section 5097.98, and the California Code of Regulations Section 15064.5(e) (CEQA). Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

CULT-4: The 2021 LRDP EIR identified a significant and unavoidable cumulative impact for the 2021 LRDP with respect to cultural resources. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

[3] Wendy Hillis, UC Berkeley Campus Architect, February 15, 2023.

[4] University of California Berkeley, July 2021, UC Berkeley 2021 Long Range Development Plan and Housing Projects #1 and #2 Environmental Impact Report, State Clearinghouse No. 2020040078, page 5.4-14.

5.1.6 ENERGY

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Evaluated in the 2021 LRDP EIR					
ENE-1: Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	LTS		X		
ENE-2: Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	NI		X		
ENE-3: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact?	LTS		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Evaluated in the 2021 LRDP EIR

ENE-1 and ENE-2: The 2021 LRDP EIR identified a less-than-significant impact at the program level for the 2021 LRDP regarding wasteful, inefficient, or unnecessary consumption of energy resources, and no impacts concerning conflicts with State or local plans for renewable energy or energy efficiency. The Proposed Project would comply with the University of California Sustainable Practices Policy, and the building would be designed to achieve U.S. Green Building Council's LEED™ Silver certification, and will strive to meet LEED™ Gold.

UC Berkeley's energy infrastructure requires substantial improvements and investment to support its transition to the clean energy system planned as part of the Clean Energy Campus project. UC Berkeley is planning a new Electrical Heating and Cooling Plant to be completed in two main stages: the first would convert the existing campus steam system to a heating hot water system with centralized heat pumps, and the second phase would involve installing a campus-wide chilled water loop. Heathcock Hall will be operational before the first stage of the EHCP is completed, but will be designed to optimize energy efficiency and reduce waste, while beneficially integrating with the EHCP at each stage. Infrastructure allowing streamlined connection to the future EHCP will be installed as part of the Proposed Project.

Prior to operation of the EHCP, Heathcock Hall would connect to the existing campus steam loop for heating and would have its own rooftop mechanical cooling system. Connecting to the campus steam

system would allow the Proposed Project to avoid installing a local electric boiler plant, which would be discarded once the EHCP is operational. Heat recovery from the building exhaust air would be captured and used within the building to optimize energy efficiency for the building.

With the completion of the first stage of the EHCP, the steam connection to Heathcock Hall would be decommissioned and replaced by a connection to the EHCP heating hot water loop. During this stage, a neighborhood-scale chilled water loop connecting the cooling plants of several buildings in the vicinity would be installed and connected to Heathcock Hall. UC Berkeley would be able to choose (by efficiency or maintenance) which systems to operate to supplement the new plant. The chilled water systems within each building could come offline at any time during their life cycle once the campus chilled water plant is online and distributed to the buildings. Heat recovery from Heathcock Hall would be rerouted to connect to the EHCP, providing greater overall campus energy efficiency than the project operating independently.

UC Berkeley anticipates that the second stage of the EHCP, the centralized production of chilled water for campus distribution, will occur within the lifespan of the Proposed Project's rooftop cooling plant. The building's cooling plant could remain as a node in the campus chilled water loop until a replacement is required, at which point the cooling capacity for Heathcock Hall would be shifted to the centralized EHCP heat pumps, minimizing equipment waste. Therefore, the project will comply with the University of California Sustainable Practices Policy.

During construction, the Proposed Project would use a combination of gas- or diesel-powered and electric equipment. Transportation energy use during construction would come from the transport and use of construction equipment, delivery vehicles and haul trucks, and construction employee vehicles that use diesel fuel and/or gasoline. Overall, use of all construction equipment would cease upon completion of project construction. Thus, impacts related to electricity and transportation fuel use during construction would be temporary and would not require expanded energy supplies or the construction of new infrastructure. Furthermore, to limit wasteful and unnecessary energy consumption, the construction contractors would minimize nonessential idling of construction equipment, in accordance with Section 2449 of the California Code of Regulations, Title 13, Article 4.8, Chapter 9, and as required by CBP AIR-3. Such required practices would limit wasteful and unnecessary energy consumption during construction.

While the Proposed Project would result in an increase in electricity demand, it would include project design features to minimize energy demand to the extent feasible. The Proposed Project would, at minimum, comply with the current Building Energy Efficiency Standards and the California Green Building Standards Code (CALGreen). In addition, the Proposed Project proposes to obtain a minimum LEED™ Silver rating.[5] Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

[5] Leadership in Energy and Environmental Design or LEED provides a framework for healthy, efficient, carbon and cost-saving green buildings. LEED certified buildings save money, improve efficiency, lower carbon emissions and create healthier places for people.

ENE-3: The 2021 LRDP EIR identified a less-than-significant cumulative impact for the 2021 LRDP with respect to energy. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.7 GEOLOGY AND SOILS

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Determined to Have No Impact in the 2021 LRDP EIR					
Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	NI		X		
Topics Evaluated in the 2021 LRDP EIR					
GEO-1: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: a) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. b) Strong seismic ground shaking? c) Seismic-related ground failure, including liquefaction? d) Landslides?	LTS		X		
GEO-2: Result in substantial soil erosion or the loss of topsoil?	LTS		X		
GEO-3: Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	LTS		X		
GEO-4: Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	LTS		X		
GEO-5: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	LTS/M		X		

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
GEO-6: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact?	LTS		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Determined to Have No Impact in the 2021 LRDP EIR

The topic of alternative wastewater disposal systems has been screened out from further evaluation because the potential future development under the 2021 LRDP, including the Proposed Project, would not include the use of septic tanks or alternative wastewater disposal systems. Therefore, no impact would occur regarding soil capability to adequately support the use of septic tanks or alternative wastewater disposal systems, and this issue is not discussed further in this Addendum. See Section 7.1.4, *Geology and Soils*, of the 2021 LRDP EIR.

Topics Evaluated in the 2021 LRDP EIR

GEO-1 though GEO-4: The 2021 LRDP EIR identified less-than-significant impacts at the program level for the 2021 LRDP with respect to the creation or exacerbation of fault rupture, earthquake ground shaking, liquefaction and related ground failure, and landslides; substantial soil erosion; location on an unstable geologic unit; or location on expansive soil. The Proposed Project site is a steep, undeveloped hillside with an approximately 34-foot drop in elevation east to west. However, the project site is not subject to landslide hazards, and the probability of subsidence impacts is generally low due to the generally uniform vertical movement in the area surrounding the project site. The project site is located in an urbanized part of the city of Berkeley and would be required to implement construction phase best management practices (BMPs) as well as post-construction site design, source-control, and treatment control measures in accordance with applicable permit requirements. The Proposed Project would adhere to CBP GEO-1 through CBP GEO-4 and CBP GEO-6 through CBP GEO-8. These CBPs require compliance with the California Building Code (CBC) and the UC Seismic Safety Policy; incorporation of recommendations for geotechnical hazard prevention in required site-specific geotechnical studies; review of all seismic and structural engineering designs; use of site-specific seismic ground motions for analysis and design; and implementation of programs and projects in emergency planning, training, response, and recovery. Furthermore, the Proposed Project would be required to comply with the Campus Design Standards, which

contain regulatory and other requirements for construction-phase and post-construction stormwater management to reduce erosion, as described in CBP GEO-9.

The expansion potential of the clay soils in the 2021 LRDP EIR Study Area varies from low to critically high.[6] Therefore, the Proposed Project has potential to expose people to hazards associated with expansive soils. However, such impacts would be avoided through compliance with the CBC and the University of California Seismic Safety Policy and with review by the Seismic Review Committee, as required by CBP GEO-1 and CBP GEO-3. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

GEO-5: The 2021 LRDP EIR identified a less-than-significant impact with mitigation concerning paleontological resources. The project site is located on the Franciscan Assemblage, which is a highly sensitive geologic formation where fossils could potentially be found. As required by 2021 LRDP EIR Mitigation Measure GEO-5, UC Berkeley would provide a paleontological resources awareness training program to all construction personnel active on the project site during earth-moving activities. Furthermore, the Proposed Project would adhere to the procedures in CBP GEO-10, to be followed in the event that a unique paleontological resource is discovered. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

GEO-6: The 2021 LRDP EIR identified a less-than-significant cumulative impact for the 2021 LRDP with respect to geology and soils. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.8 GREENHOUSE GAS EMISSIONS

Would the Proposed Project:

Environmental Issues		Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
			New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Evaluated in the 2021 LRDP EIR						
GHG-1:	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	LTS		X		
GHG-2:	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	LTS/M		X		

[6] University of California Berkeley, July 2021, UC Berkeley 2021 Long Range Development Plan and Housing Projects #1 and #2 Environmental Impact Report, State Clearinghouse No. 2020040078, page 5.6-33.

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
GHG-3: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact?	LTS		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Evaluated in the 2021 LRDP EIR

GHG-1: The 2021 LRDP EIR identified less-than-significant impacts at the program level for the 2021 LRDP regarding the generation of greenhouse gas (GHG) emissions. Construction and operation of the Proposed Project would generate an increase in GHG emissions from transportation sources (passenger vehicles, trucks, delivery vehicles), water use and wastewater generation, and solid waste generation. GHG emissions associated with the Proposed Project are included in the 2021 LRDP emissions forecast, which was determined not to contribute a significant amount of GHG emissions or contribute to existing cumulative emissions impacts. Furthermore, UC Berkeley conducts annual GHG emissions inventories and implements the University of California Office of the President and UC Berkeley sustainability and policy initiative, which would apply to the Proposed Project. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

GHG-2: The 2021 LRDP EIR identified less-than-significant impacts with mitigation concerning conflict with applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions. Such plans include California Air Resources Board's Scoping Plan outlining the State's strategies to reduce GHG emissions in accordance with the targets established under Assembly Bill (AB) 32 and Senate Bill (SB) 32, as well as Metropolitan Transportation Commission/Association of Bay Area Governments' Plan Bay Area 2040 to achieve the passenger vehicle emissions reductions identified under SB 375. New buildings are required to comply with the current Building Energy Efficiency Standards and CALGreen as well as the statewide strategies to reduce GHG emissions. Because the Proposed Project includes only two (ADA-compliant) parking stalls to serve the Proposed Project and campus-wide accessibility needs, users of the building would access the site through nonvehicular modes of transportation. During operation of Heathcock Hall, vehicle trips would be limited almost entirely to delivery and maintenance vehicles; therefore, the Proposed Project would generate minimal new vehicle trips to the project site. In addition, as described in Section 4.3, *Development Program Consistency*, the Proposed Project would provide a new building to house UC Berkeley's existing College of Chemistry departments and would not result in student or employment

population growth at UC Berkeley. As such, the UC Berkeley campus population would remain within population levels analyzed in the 2021 LRDP EIR and the Proposed Project would not be a significant growth-inducing project. Thus, it would be consistent with the overall goals of Plan Bay Area 2040 in concentrating new development in locations where there is existing infrastructure. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

GHG-3: The 2021 LRDP EIR identified a less-than-significant cumulative impact for the 2021 LRDP with respect to GHG emissions. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.9 HAZARDS AND HAZARDOUS MATERIALS

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Determined to Have No Impact in the 2021 LRDP EIR					
For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, result in a safety hazard or excessive noise for people residing or working in the project area?	NI		X		
Topics Evaluated in the 2021 LRDP EIR					
HAZ-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	LTS		X		
HAZ-2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	LTS		X		
HAZ-3: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	LTS		X		
HAZ-4: Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	LTS			X	

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
HAZ-5: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	LTS		X		
HAZ-6: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact?	LTS		X		
*Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	*See Section 4.1.20, Wildfire, of this Addendum*				

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable
* Note: Impacts related to exposing people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires are fully discussed in the Draft EIR in Chapter 5.18, Wildfire, and in this Addendum in Section 5.1.20, Wildfire. Therefore, this standard is not discussed in this section.

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Determined to Have No Impact in the 2021 LRDP EIR

The topic of airport-related hazards has been screened out from further evaluation because the EIR Study Area is not within an airport land use plan or within two miles of an airport. The nearest public airport is the Oakland International Airport, roughly ten miles south of the planning area. Therefore, no impact would occur regarding hazards related to the Proposed Project's location within an airport land use plan area or within two miles of a public airport or public use airport. Consequently, this issue is not discussed further in this Addendum. See Section 7.1.5, *Hazards and Hazardous Materials*, of the 2021 LRDP EIR.

Topics Evaluated in the 2021 LRDP EIR

HAZ-1 through HAZ-4: The 2021 LRDP EIR identified less-than-significant impacts at the program level for the 2021 LRDP with respect to the hazards associated with the use, handling, disposal, and release of hazardous materials. The closest sensitive receptors to the Proposed Project are the Foothill Residence Halls, located about 250 feet from the Proposed Project; the closest off-site sensitive receptors are residences located approximately 530 feet north of the Proposed Project along Hearst Avenue. No existing or proposed schools are located within one quarter mile of the Proposed Project site. These receptor locations could be potentially exposed to hazardous materials from the proposed construction and operation of the Proposed Project.

Construction activities for the Proposed Project would include the use of materials such as fuels, lubricants, and greases in construction equipment and coatings. The potential exists for these materials to spill or to create hazardous conditions. However, the materials used would not be in such quantities or stored in such a manner as to pose a significant safety hazard to nearby sensitive receptors. Fugitive dust would be generated primarily from ground-disturbing and material-loading activities in addition to vehicles traveling over unpaved surfaces. However, fugitive dust associated with construction activities would not expose off-site sensitive receptors to substantial concentrations of air pollutants (see Appendix B, *Construction Health Risk Assessment*, of this Addendum). To prevent hazardous conditions, existing UC Berkeley, State, and federal laws would be enforced at the construction site. Furthermore, these activities would also be short term or one time in nature and would cease upon completion of the construction phases for the Proposed Project.

Operation of the Proposed Project would involve the use of hazardous materials, such as cleansers, paints, fertilizers, and pesticides, for cleaning and maintenance purposes. Concurrent with an increase in laboratory and other research facility space would be a potential increase in the use of hazardous materials and chemicals, biohazardous materials, radioactive materials, transgenic material, and production of wastes associated with laboratory research activities during operation of Heathcock Hall. However, hazardous materials stored and handled on the UC Berkeley campus would not pose a risk to occupants or nearby sensitive receptors, including residents of the Foothill Residence Halls located across Gayley Road, in case of an accidental release, because the building systems will be designed to mitigate potential exposure and risks to occupants and nearby sensitive receptors. Moreover, a risk management plan would be prepared in accordance with the State of California's Accidental Release Prevention program requirements, if necessary. Additionally, the use, storage, transport, and disposal of hazardous materials would be governed by existing regulations of several agencies, including the Environmental Protection Agency, Department of Toxic Substances Control, U.S. Department of Transportation, International Air Transport Association, California Division of Occupational Safety and Health, and UC Berkeley Office of Environment, Health & Safety (EH&S) programs and policies.

The Proposed Project would adhere to CBP HAZ-1 and CBP HAZ-3, which requires the continued implementation of equivalent health and safety plans, programs, guidelines, practices, and procedures related to the use, storage, disposal, or transportation of hazardous materials, including transgenic plants, and wastes.

The project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and would result in no impact to the public or the environment. Regardless, the Proposed Project would adhere to CBP HAZ-5, and UC Berkeley would perform a site history and due diligence assessment of the project site where ground-disturbing construction is proposed, to assess the potential for soil and groundwater contamination resulting from past or current site land uses at the site or in the vicinity. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

HAZ-5: The 2021 LRDP EIR identified less-than-significant impacts concerning adopted emergency response plans or emergency evacuation plans. The Proposed Project would be required to comply with the provisions of the California Fire Code (CFC) and the CBC, which would ensure that building and life safety

measures are incorporated into the Proposed Project and would facilitate implementation of emergency response plans. During construction, the Proposed Project would be required to comply with all applicable provisions of the CFC to ensure fire safety during the construction phase. The Proposed Project would not involve physical components that would interfere with the ability of UC Berkeley, the city of Berkeley, Alameda County, or emergency response service providers to implement emergency response activities within the project site or vicinity. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

HAZ-6: The 2021 LRDP EIR identified a less-than-significant cumulative impact for the 2021 LRDP with respect to hazards and hazardous materials. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.10 HYDROLOGY AND WATER QUALITY

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Evaluated in the 2021 LRDP EIR					
HYD-1: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	LTS		X		
HYD-2: Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	LTS		X		
HYD-3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: a) Result in substantial erosion or siltation on- or off-site? b) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; c) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or d) Impede or redirect flood flows?	LTS		X		

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
HYD-4: In flood, hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	LTS		X		
HYD-5: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	LTS		X		
HYD-6: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact?	LTS		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Evaluated in the 2021 LRDP EIR

HYD-1 through HYD-5: The 2021 LRDP EIR identified less-than-significant impacts at the program level for the 2021 LRDP with respect to hydrology and water quality. Because the Proposed Project would involve the disturbance of more than one acre of land, it would be required to comply with the requirements of the Construction General Permit, which includes submitting Permit Registration Documents to the State Water Resources Control Board and preparing and implementing a Stormwater Pollution Prevention Plan that includes measures to reduce the potential for erosion, siltation, and pollutants to enter the storm drain system. The UC Berkeley EH&S office or a designated third party would also verify that the Proposed Project complies with all applicable requirements and BMPs.

The Proposed Project's post-construction stormwater management strategy is a new approach by UC Berkeley to implement a campuswide stormwater credit program to meet UC Berkeley's MS4 permit requirements. Rather than meeting post-construction stormwater requirements within the project site, the campuswide stormwater approach would measure compliance with UC Berkeley's MS4 permit at a campuswide level. The Proposed Project would therefore pay into the credit program based on a formula of new impervious surface area resulting from the Proposed Project. The credit program would construct a multifunctional centralized stormwater facility that collects, treats, and removes pollutants from stormwater runoff equivalent to the requirements generated by the Proposed Project (and other participating buildings and site areas) prior to discharge into Strawberry Creek. Furthermore, East Bay Municipal Utility District (EBMUD) does not use groundwater for water supply, and therefore implementation of the project would not decrease groundwater supplies. The groundwater basin that

extends under the project site is not currently the local water supply and does not serve local or planned land uses. The proposed site is not in a 100-year floodplain or within a dam or tsunami inundation zone.

Construction dewatering would be required for the Proposed Project due to the presence of shallow groundwater. The effects of dewatering are temporary in nature and would not substantially interfere with groundwater recharge nor contribute to the lowering of the local groundwater table. No issues regarding contaminated soil or groundwater have been reported at the site. However, a dewatering plan must be submitted by the contractor and approved by UC Berkeley EH&S and Facilities Services offices prior to the start of construction to ensure that all disposal of water is in accordance with State and local regulations.

The Proposed Project would adhere to CBP HYD-1, CBP HYD-2 and CBP HYD-5 through CBP HYD-8, and CBP HYD-13. In implementing these CBPs, UC Berkeley reviews each development project to determine whether project runoff would affect rainwater infiltration to groundwater or increase pollutant loading and verify that the Proposed Project complies with all applicable requirements and BMPs. UC Berkeley also continues to manage runoff into storm drain systems to avoid no net increase in runoff over existing conditions. Dewatering would be monitored and maintained by qualified engineers in compliance with the Campus Design Standards and applicable regulations. Additionally, landscaped areas of the project site would be designed to absorb runoff from rooftops and walkways to the maximum extent practical.

Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

HYD-6: The 2021 LRDP EIR identified a less-than-significant cumulative impact for the 2021 LRDP with respect to hydrology and water quality. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.11 LAND USE AND PLANNING

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Evaluated in the 2021 LRDP EIR					
LU-1: Physically divide an established community?	LTS		X		
LU-2: Cause a significant environmental impact due to a conflict with any land use plan, or policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	LTS		X		
LU-3: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact?	LTS		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Evaluated in the 2021 LRDP EIR

LU-1: The 2021 LRDP EIR identified less-than-significant impacts at the program level for the 2021 LRDP with respect to established communities. The Proposed Project would be an infill development within the Campus Park that would not divide established communities. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

LU-2: The 2021 LRDP EIR identified less-than-significant impacts concerning conflict with any land use plan, or policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. UC Berkeley is constitutionally exempt from local regulations whenever using property under its control in furtherance of its educational mission. The Proposed Project is consistent with the land uses and intensities of development contemplated in the 2021 LRDP, which prioritizes development sites on the Campus Park for academic and research space. Moreover, the Proposed Project would support 2021 LRDP goals by providing a range of spaces for laboratories, associated non-lab workspace, office space, and other support and collaboration meeting spaces. The building would house researchers, faculty, and students across multiple disciplines affiliated with the College of Chemistry. Furthermore, the Proposed Project would adhere to CBP LU-1, which requires new projects in the Campus Park to conform to the Physical Design Framework. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

LU-3: The 2021 LRDP EIR identified a less-than-significant cumulative impact for the 2021 LRDP with respect to land use and planning. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.12 MINERAL RESOURCES

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Determined to Have No Impact in the 2021 LRDP EIR					
Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	NI		X		

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	NI		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Determined to Have No Impact in the 2021 LRDP EIR

The 2021 LRDP EIR did not analyze impacts to mineral resources because there are no areas in the EIR Study Area, including the project site, with development potential that contain mineral resources where there is adequate information indicating significant mineral deposits or the high likelihood of significant mineral deposits. Accordingly, this issue is not discussed further in this Addendum. See Section 7.1.6, *Mineral Resources*, of the 2021 LRDP EIR.

5.1.13 NOISE

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Determined to Have No Impact in the 2021 LRDP EIR					
For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	NI		X		
Topics Evaluated in the 2021 LRDP EIR					
NOI-1: Generate substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	SU		X		

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
NOI-2: Generate excessive groundborne vibration or groundborne noise levels?	LTS/M		X		
NOI-3: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact?	SU		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Determined to Have No Impact in the 2021 LRDP EIR

The topic of airport-related noise has been screened out from further evaluation because the EIR Study Area is not within two miles of an airport. The nearest public airport is the Oakland International Airport, roughly ten miles south of the planning area. Therefore, no impact would occur regarding noise hazards due to proximity to airports. Consequently, this issue is not discussed further in this Addendum. See Section 7.1.7, *Noise*, of the 2021 LRDP EIR.

Topics Evaluated in the 2021 LRDP EIR

NOI-1: The 2021 LRDP EIR identified significant and unavoidable impacts at the program level for the 2021 LRDP with respect to ambient noise levels because construction activities associated with potential future projects may occur near noise-sensitive receptors, and noise disturbances may occur for prolonged periods or during the more sensitive nighttime hours or may exceed UC Berkeley's adopted construction noise standards, even with project-level mitigation. Two types of short-term noise impacts could occur during construction of the Proposed Project: (1) mobile-source noise from the transport of workers, material deliveries, and debris/soil hauling and (2) stationary-source noise from use of construction equipment. The transport of workers and materials to and from the construction site would incrementally increase noise levels along local roadways. Anticipated construction equipment would include, but is not limited to, concrete and industrial saws, tractors, backhoes/loaders, graders, dozers, generators, excavators, compressors, plate compactors, sweepers, pavers, rollers, mixers, dewatering pumps, forklifts, and a crane. Construction of the Proposed Project would temporarily increase the noise level of the ambient noise environment and would have the potential to affect noise-sensitive land uses in the vicinity of the project site.

The closest sensitive receptors to the Proposed Project are the Foothill Residence Halls, located about 250 feet east of the Proposed Project; the closest off-site sensitive receptors are residences located approximately 530 feet north of the Proposed Project along Hearst Avenue. The proposed location of Heathcock Hall is an undeveloped hillside with an approximately 34-foot drop in elevation east to west. Therefore, noise generated by demolition and grading activities will be partially attenuated by the hillside itself at the surrounding noise-sensitive receptors to the east. Furthermore, off-site sensitive receptors beyond 500 feet would have noise attenuated below levels of concern additionally by distance and existing vegetation and buildings. Therefore, the Proposed Project would not require any mitigation or temporary noise barriers to reduce construction noise levels.

Similar to the construction phase, two types of noise impacts could occur during operation of the Proposed Project: (1) mobile-source noise from vehicles traveling to and from the Proposed Project (from visitors and deliveries) and (2) stationary-source noise from people and equipment on the project site. Based on the program-level traffic noise analysis conducted for the 2021 LRDP EIR, cumulative traffic noise at full buildout of the 2021 LRDP is anticipated to increase 0.3 dBA (A-weighted decibels) along Gayley Road between Stadium Rim Way and University Drive and by 0.3 dBA along Gayley Road north of University Drive.[7] These increases are under the 1.5 dBA threshold identified in the 2021 LRDP EIR as the minimum level of noise increase considered to represent a significant impact, depending on the ambient noise environment.[8] Traffic noise increases associated with the operation of the Proposed Project are expected to be minimal because the Proposed Project would not result in an increase to the UC Berkeley campus population.

Regarding stationary noise sources, the Proposed Project would adhere to CBP NOI-1, which requires mechanical equipment selection and building design shielding to be used as appropriate so that noise levels from building operations would not exceed the limits of the city of Berkeley Noise Ordinance. The Proposed Project would also adhere to CBP NOI-2, which lists required measures to be implemented for all construction projects to minimize site disruptions. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

NOI-2: The 2021 LRDP EIR identified less-than-significant impacts with mitigation concerning groundborne vibration levels associated with construction. Vibration generated by construction equipment has the potential to damage or annoy nearby receptors. As required by 2021 LRDP EIR Mitigation Measure NOI-2, the Proposed Project would implement steps concerning the use of vibration-causing construction activities/equipment and, depending on construction activity/equipment and distances to receptors, would implement alternative methods/equipment and a construction vibration monitoring program, as required. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

[7] University of California Berkeley, July 2021, UC Berkeley 2021 Long Range Development Plan and Housing Projects #1 and #2 Environmental Impact Report, State Clearinghouse No. 2020040078, Table 5.11-11, page 5.11-27.

[8] University of California Berkeley, July 2021, UC Berkeley 2021 Long Range Development Plan and Housing Projects #1 and #2 Environmental Impact Report, State Clearinghouse No. 2020040078, page 5.11-26.

NOI-3: The 2021 LRDP EIR identified a significant and unavoidable cumulative impact for the 2021 LRDP with respect to noise. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.14 POPULATION AND HOUSING

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Evaluated in the 2021 LRDP EIR					
POP-1: Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	LTS/M			X	
POP-2: Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	LTS/M				X
POP-3: In combination with past, present, and reasonably foreseeable projects, result in significant cumulative impacts?	LTS		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Evaluated in the 2021 LRDP EIR

POP-1 and POP-2: The 2021 LRDP EIR identified less-than-significant impacts with mitigation at the program level for the 2021 LRDP with respect to unplanned population growth and displacement of people and housing. The Proposed Project includes laboratories, associated non-lab workspace, office space, and other support and collaboration meeting spaces. The Proposed Project is planned for nonresidential uses and does not involve new homes or businesses. The project site is currently undeveloped, and the Proposed Project would not displace people or housing because the existing project site does not house any residents. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

POP-3: The 2021 LRDP EIR identified a less-than-significant cumulative impact for the 2021 LRDP with respect to population and housing. The cumulative setting for the Proposed Project is buildout under the

2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.15 PUBLIC SERVICES

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Evaluated in the 2021 LRDP EIR					
PS-1: Result in substantial adverse physical impacts associated with the need for new or physically altered police facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for police services?	LTS		X		
PS-2: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact to police services?	LTS		X		
PS-3: Result in substantial adverse physical impacts associated with the need for new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection services?	LTS		X		
PS-4: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact to fire protection services?	LTS		X		
PS-5: Result in substantial adverse physical impacts associated with the need for new or physically altered school facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable performance objectives for school services?	LTS		X		
PS-6: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact to schools?	LTS		X		
PS-7: In order to maintain acceptable service ratios or other performance objectives, the Proposed Project would result in the provision of or need for new or physically altered library facilities, the construction or operation of which could cause significant environmental impacts?	LTS		X		

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
PS-8: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact to public services?	LTS		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Evaluated in the 2021 LRDP EIR

PS-1, PS-3, PS-5, and PS-7: The primary purpose of the public services impact analysis is to examine the impacts associated with physical improvements to public service facilities required to maintain acceptable service ratios, response times, or other performance objectives. Public service facilities need improvements (i.e., construction, renovation, or expansion) as demand for services increases. Increased demand is typically driven by increases in population. A project would have a significant environmental impact if it would exceed the ability of public service providers to adequately serve the population, thereby requiring construction of new facilities or modification of existing facilities.

The 2021 LRDP EIR identified less-than-significant impacts at the program level for the 2021 LRDP with respect to public services. The Proposed Project would accommodate a daytime population that would represent a more intense use of the project site when compared to its existing undeveloped state. As described in Section 4.3, *Development Program Consistency*, the Proposed Project would provide a new building to house UC Berkeley's existing College of Chemistry departments and would not result in student or employment population growth at UC Berkeley. As such, the UC Berkeley campus population would remain within levels analyzed in the 2021 LRDP EIR. Accordingly, the Proposed Project would not require the construction, renovation, or expansion of police services, fire protection services, school services, or library facilities in the project area. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

PS-2, PS-4, PS-6, and PS-8: The 2021 LRDP EIR identified less-than-significant cumulative impacts for the 2021 LRDP with respect to public services. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.16 PARKS AND RECREATION

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Evaluated in the 2021 LRDP EIR					
REC-1: Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered parks facilities, need for new or physically altered parks facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for parks services?	LTS		X		
REC-2: Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	LTS		X		
REC-3: Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	LTS		X		
REC-4: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact related to parks and recreation?	LTS		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Evaluated in the 2021 LRDP EIR

REC-1 through REC-3: The 2021 LRDP EIR identified less-than-significant impacts at the program level for the 2021 LRDP with respect to parks and recreational facilities. The Proposed Project does not involve housing that would induce population growth and would not remove any existing parks or recreational space. Therefore, implementation of the Proposed Project is not anticipated to create a need for new or altered parks or recreational facilities or increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration would occur or be accelerated. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

REC-4: The 2021 LRDP EIR identified a less-than-significant cumulative impact for the 2021 LRDP with respect to parks and recreation. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.17 TRANSPORTATION

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Evaluated in the 2021 LRDP EIR					
TRAN-1: Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	LTS/M		X		
TRAN-2: Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	LTS		X		
TRAN-3: Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	SU			X	
TRAN-4: Result in inadequate emergency access?	LTS		X		
TRAN-5: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact?	SU		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Evaluated in the 2021 LRDP EIR

TRAN-1: The 2021 LRDP EIR identified less-than-significant impacts with mitigation at the program level for the 2021 LRDP with respect to conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. The Proposed Project would improve and relocate the existing AC Transit bus stop and shelter on the west side of Gayley Road to a nearby location. During construction, access along Gayley Road may be periodically disrupted and UC Berkeley will locate a temporary bus stop. The Proposed Project would be an infill development within the Campus Park and would not result in an increase to the UC Berkeley campus population. Furthermore, the Proposed Project would adhere to CBP TRAN-1 by ensuring bicycle, pedestrian, and transit access to the Proposed

Project throughout construction and operation of the building. Additionally, UC Berkeley will implement CBP TRAN-4 by working with the city of Berkeley and AC Transit to coordinate transit access to the new academic building. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

TRAN-2: Pursuant to CEQA Guidelines Section 15064.3(b)(1), projects within half a mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less-than-significant transportation impact. Accordingly, the 2021 LRDP EIR did not evaluate impacts for projects within this screening distance. Due to its location within half a mile of an existing high quality transit corridor (AC Transit line 52) and a Transit Priority Area, transportation impacts related to vehicle miles traveled (VMT) from the Proposed Project are presumed to be less than significant. Accordingly, no quantified VMT analysis is presented in this Addendum. See Section 7.1.8, *Transportation*, of the 2021 LRDP EIR.

TRAN-3: The 2021 LRDP EIR identified significant and unavoidable impacts in regard to hazards due to a geometric design feature or incompatible uses because of the unknowns of future buildings and structures at the time of analysis. The Proposed Project would be an infill development within the Campus Park and therefore would not introduce an incompatible use with the potential to create a transportation hazard. While the Proposed Project would not include modifications in the city of Berkeley public right-of-way (as Gayley Road is owned by UC Berkeley), it would reconstruct the Gayley Road/University Drive intersection and associated sidewalks to improve local accessibility created by existing topography, pedestrian safety, lighting, and paving. Improvements to pedestrian and bicycle routes through and around the project site would be designed and constructed based on the applicable design standards and guidelines so as not to substantially increase hazards due to a geometric design feature related to roadway or sidewalks.

The 2021 LRDP EIR identifies a significant impact associated with pedestrian (ground) level wind hazards for new buildings that are 100 feet or more in height and includes Mitigation Measure TRAN-3 requiring a wind hazards analysis for buildings of this height. The building's parapet, at its northwest corner, would rise to no more than 95 feet above grade; therefore, no mitigation is required.

Furthermore, the Proposed Project would adhere to CBP TRAN-5 through CBP TRAN-8, which require UC Berkeley to reimburse the city of Berkeley for its fair share of costs associated with damage to city streets from UC Berkeley construction activities; manage project schedules to minimize the overlap of excavation or other heavy truck activity periods that have the potential to combine impacts on traffic loads and street system capacity; and require contractors working on major new construction or major renovation projects to develop and implement a Construction Traffic Management Plan.

Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

TRAN-4: The 2021 LRDP EIR identified less-than-significant impacts concerning inadequate emergency access. The Proposed Project would provide emergency vehicle access along Gayley Road and University Drive. The Proposed Project would reconstruct the Gayley Road and University Drive intersection to accommodate the turning radius of emergency vehicles. Therefore, the Proposed Project would not result

in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

TRAN-5: The 2021 LRDP EIR identified a significant and unavoidable cumulative impact for the 2021 LRDP with respect to transportation. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.18 TRIBAL CULTURAL RESOURCES

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Evaluated in the 2021 LRDP EIR					
TCR-1: Cause a substantial adverse change in the significance of a Tribal Cultural Resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is: a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of the Public Resource Code Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance to a California Native American tribe?	LTS/M		X		
TCR-2: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact to tribal cultural resources?	LTS		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Evaluated in the 2021 LRDP EIR

TCR-1: The 2021 LRDP EIR identified less-than-significant impacts with mitigation at the program level for the 2021 LRDP with respect to tribal cultural resources. UC Berkeley did not receive information as a result of the tribal consultation process that the 2021 LRDP would potentially impact a known tribal cultural resource and the 2021 LRDP EIR identified the project site as having a low archaeological sensitivity. Nevertheless, the project site has the potential to contain resources that may be associated with Native Americans. Accordingly, development on the project site could impact potential tribal cultural resources, including Native American artifacts and human remains. The Proposed Project would implement 2021 LRDP EIR Mitigation Measure TCR-1, which requires implementation of Mitigation Measure CUL-2, described in the Cultural Resources section of this Addendum. Therefore, the Proposed Project would not result in any new or more severe impacts than were identified in the 2021 LRDP EIR, and no new mitigation measures would be required.

TCR-2: The 2021 LRDP EIR identified a less-than-significant cumulative impact for the 2021 LRDP with respect to tribal cultural resources. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.19 UTILITIES AND SERVICE SYSTEMS

Would the Proposed Project:

Environmental Issues		Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
			New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Evaluated in the 2021 LRDP EIR						
UTIL-1:	Require or result in the relocation or construction of new or expanded water facilities, the construction or relocation of which could cause significant environmental effects?	LTS		X		
UTIL-2:	Not have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	LTS		X		
UTIL-3:	In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact related to water supply?	LTS		X		

Would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRDP	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
UTIL-4: Require or result in the relocation or construction of new or expanded wastewater treatment or facilities, the construction or relocation of which could cause significant environmental effects?	LTS		X		
UTIL-5: Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	LTS		X		
UTIL-6: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact related to wastewater?	LTS		X		
UTIL-7: Require or result in the relocation or construction of new or expanded stormwater drainage facilities, the construction or relocation of which could cause significant environmental effects?	LTS		X		
UTIL-8: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact related to stormwater?	LTS		X		
UTIL-9: Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	LTS		X		
UTIL-10: Not comply with federal, State, and local management and reduction statutes and regulations related to solid waste?	LTS		X		
UTIL-11: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact related to solid waste?	LTS		X		
UTIL-12: Require or result in the relocation or construction of new or expanded electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	LTS		X		
UTIL-13: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact related to electric power, natural gas, or telecommunications?	LTS		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Evaluated in the 2021 LRDP EIR

UTIL-1 and UTIL-2: The 2021 LRDP EIR identified less-than-significant impacts at the program level for the 2021 LRDP with respect to water facilities and supply. The Orinda Water Treatment Plant has maximum capacity of 200 million gallons per day (MGD). Full implementation of the 2021 LRDP would increase demand by 348 MG/year or approximately 1 MGD, which would amount to less than 1 percent of the plant's capacity and would not have an adverse effect on the plant's operation.[9] With a combination of water conservation measures and acquisition of supplemental supplies, EBMUD would be able to accommodate water demand in normal, single dry years, and multiple dry years. The Proposed Project would adhere to CBP USS-1, CBP USS-3, and CBP USS-4, which require UC Berkeley to continue to evaluate the size of existing distribution lines and the pressure of the specific feed affected by development; incorporate specific water conservation measures into project design; and analyze water and sewer systems on a project-by-project basis. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

UTIL-4 and UTIL-5: The 2021 LRDP EIR identified less-than-significant impacts in regard to wastewater treatment. EBMUD's wastewater treatment plant has a residual capacity of 57 MGD and can accommodate the increase of 0.70 MGD in wastewater generation from the 2021 LRDP.[10] The increased wastewater demand would represent about 0.67 percent of the wastewater treatment plant's excess capacity, and the average annual daily flow is well below the permitted capacity. The Proposed Project has been designed to minimize water consumption and wastewater production. Furthermore, since the Proposed Project would connect to the UC Berkeley sewer system, it is included in UC Berkeley's annual payment of fees to the city of Berkeley. Wastewater discharge would also be required to comply with EBMUD's wastewater control ordinance, EBMUD Wastewater Discharge Permit for UC Berkeley, and the UC Berkeley sewer system management plan. The Proposed Project would adhere to CBP USS-3 and CBP USS-4, as well as CBP USS-5 requiring payments to service providers to help fund wastewater treatment collection facilities in conformance with California Government Code Section 54999. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

UTIL-7: The 2021 LRDP EIR identified less-than-significant impacts concerning stormwater facilities. The Campus Park is generally an urbanized and developed area that contains a large amount of impervious surface. The Proposed Project site includes a steep, undeveloped hillside. As described above in Section

[9] University of California Berkeley, July 2021, UC Berkeley 2021 Long Range Development Plan and Housing Projects #1 and #2 Environmental Impact Report, State Clearinghouse No. 2020040078, page 5.17-15.

[10] University of California Berkeley, July 2021, UC Berkeley 2021 Long Range Development Plan and Housing Projects #1 and #2 Environmental Impact Report, State Clearinghouse No. 2020040078, page 5.17-32.

5.1.10, *Hydrology and Water Quality*, the Proposed Project would participate in a campuswide stormwater credit program to meet UC Berkeley's MS4 permit requirements. The Proposed Project would pay into the credit program based on a formula of new impervious surface area resulting from the project. The credit program would construct a centralized stormwater facility that collects, treats, and removes pollutants from stormwater runoff equivalent to the requirements generated by the Proposed Project (and other participating buildings and site areas) prior to discharge into Strawberry Creek. This campuswide stormwater approach allows UC Berkeley to implement more environmentally impactful low-impact development (LID) facilities, rather than resorting to project-by-project installation of piecemeal and hard to maintain "grey infrastructure." A campuswide regulatory approach would facilitate the realization of centralized, multi-benefit facilities, which not only treat stormwater runoff, but consolidate operations and maintenance, enhance open space character, and add ecological value.

The Proposed Project would comply with the requirements of the Phase II MS4 Permit by participating in a campus-wide stormwater management system, which provides code compliant mitigation for projects that do not have sufficient area to construct landscape based LID measures. To meet MS4 Permit requirements, the Proposed Project will purchase campus stormwater credits, engaging in a program under which UC Berkeley manages runoff into storm drain systems so that the aggregate effect of new projects creates no net increase in runoff over existing conditions. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

UTIL-9 and UTIL-10: The 2021 LRDP EIR identified less-than-significant impacts regarding solid waste generation and regulation. The Proposed Project would comply with the 2019 CALGreen Building Code Standards, the requirements of AB 341, AB 1826, SB 1383, SB 1335, the State Agency Buy Recycled Campaign, the city of Berkeley's Single Use Foodware Ordinance, and University of California's Sustainable Practices policies. The Keller Canyon Landfill would be able to accommodate projected solid waste from buildout of the 2021 LRDP until its closure date in 2030. If UC Berkeley has not yet met its zero-waste goal at that date, then an alternate landfill, such as Altamont Landfill, would be able to accommodate solid waste from UC Berkeley. Furthermore, the Proposed Project would adhere to CBP USS-6 and CBP USS-7, which require UC Berkley to continue implementing zero waste requirements, and contractors working for UC Berkeley to report their solid waste diversion. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

UTIL-12: The 2021 LRDP EIR identified less-than-significant impacts related to electric power, natural gas, and telecommunications. The 2021 LRDP would result in an increase in electricity consumption. The Proposed Project is an infill development. The project site is already served by electrical infrastructure and would not result in the relocation or construction of new or expanded electric power facilities. The 2021 LRDP would result in a net decrease in natural gas usage over the buildout horizon because University of California and UC Berkeley energy policies prohibit new natural gas connections in new construction or large renovation projects on sites that are not in the cogeneration plant system, which currently uses natural gas. As described in Section 5.1.6, *Energy*, the Proposed Project would initially connect to the campus cogeneration plant for heating and would have its own rooftop mechanical cooling system. Once the campus's new EHCP is completed and operational, the steam connection to Heathcock Hall would be decommissioned and replaced by a connection to the EHCP heating hot water loop; the building would then not use natural gas, providing a more efficient and cleaner energy system.

UC Berkeley is already served by telecommunications infrastructure, and the Proposed Project is anticipated to connect to existing telecommunication facilities and would not result in the relocation or construction of new or expanded telecommunications facilities off-site. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

UTIL-3, UTIL-6, UTIL-8, UTIL-11, and UTIL-13: The 2021 LRDP EIR identified a less-than-significant cumulative impact for the 2021 LRDP with respect to utilities and service systems. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.1.20 WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Proposed Project:

Environmental Issues	Level of Impact for the 2021 LRDP in the 2021 LRDP EIR	Environmental Effects of the Proposed Project			
		New Less-Than-Significant Impact	Same Impact as 2021 LRD"	Less Impact Than 2021 LRDP	Topic Not Applicable to the Proposed Project
Topics Evaluated in the 2021 LRDP EIR					
WF-1: Substantially impair an adopted emergency response plan or emergency evacuation plan?	LTS		X		
WF-2: Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	SU		X		
WF-3: Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	SU		X		
WF-4: Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	SU		X		
WF-5: In combination with past, present, and reasonably foreseeable projects, result in a cumulative impact related to wildfire?	SU		X		

Key: NI = no impact; LTS = less than significant; LTS/M = less than significant with mitigation; SU = significant and unavoidable

Summary of Analysis

No new significant or more severe impact than analyzed in the 2021 LRDP EIR.

Discussion

Topics Evaluated in the 2021 LRDP EIR

WF-1: The 2021 LRDP EIR identified a less-than-significant impact at the program level for the 2021 LRDP with respect to impairment of an adopted emergency response plan or emergency evacuation plan. The Proposed Project is not in a designated Fire Hazard Severity Zone (FHSZ) or California Public Utilities Commission high-fire-threat district. The Proposed Project is in an urbanized area surrounded by existing development. However, the Proposed Project is located within a Wildland Urban Interface (WUI) and within one-quarter mile of the Alameda County Local Responsibility Area (LRA) Very High FHSZ, and therefore vulnerable to wildfires in the area. The city of Berkeley identifies Hearst Avenue and Oxford Street, two roadways near to the Proposed Project, as emergency evacuation routes;[11] however, development of the Proposed Project would not alter these or other surrounding roadways. UC Berkeley has its own Emergency Preparedness Program and Emergency Operations Plan and coordinates emergency preparations, response, and recovery activities, such as those pertaining to wildfire, under its Office of Emergency Management. The Proposed Project would be required to integrate these plans. In addition, the Proposed Project would comply with applicable regulations that involve fire prevention and safety measures, such as the CBC and CFC. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

WF-2 and WF-4: The 2021 LRDP EIR identified significant and unavoidable impacts concerning exacerbation of wildfire risks due to steep terrain and heavy vegetation in the Hill Campus East. The project site is located west of the Hill Campus East zone within the Campus Park. Because the project site is an already urbanized area and is not within a FHSZ, the Proposed Project would not, from prevailing winds or other factors such as vegetation, exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. In addition, the project site is not subject to landslide hazards and is not within a flood hazard zone. Under CBP WF-3, UC Berkeley will continue to plan and implement programs to reduce risk of wildland fires. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

WF-3: The 2021 LRDP EIR identified significant and unavoidable impacts concerning installation or maintenance of associated infrastructure in the Very High FHSZ that may exacerbate fire risk due to the potential unknown impacts from future development at the time of analysis. The Proposed Project would involve new utility connections to existing utility infrastructure on the Campus Park and would include improvements to the on-campus roadways accessing the project site. Construction of the project would not require additional off-site utilities infrastructure. Due to the location of the Proposed Project outside of the fire hazard severity zones, the installation of on-site utilities and infrastructure would not exacerbate fire risks. Furthermore, 2021 LRDP EIR Mitigation Measure WF-3 would require electrical lines associated with future electrical infrastructure to be undergrounded. Therefore, the Proposed Project would not

[11] City of Berkeley, Emergency Access and Evacuation Network, https://berkeleyca.gov/sites/default/files/documents/Berkeley-Emergency-Access-Evacuation-Routes-06-2011.pdf, accessed February 7, 2023.

result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

WF-5: The 2021 LRDP EIR identified a significant and unavoidable cumulative impact for the 2021 LRDP with respect to wildfire. The cumulative setting for the Proposed Project is buildout under the 2021 LRDP, and the Proposed Project would not result in additional development beyond what was analyzed in the 2021 LRDP EIR. Therefore, the Proposed Project would not result in any new significant impacts or a substantial increase in the severity of a previously identified significant impact.

5.2 MANDATORY FINDINGS OF SIGNIFICANCE

Would the Proposed Project:

	Environmental Issues	New Less-Than-Significant Impact	Topic Not Applicable to the Proposed Project
a)	Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	X	
b)	Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	X	
c)	Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	X	

Discussion

a) With respect to biological resources and cultural resources, development under the Proposed Project would not change from the 2021 LRDP. The Proposed Project would not increase the 2021 LRDP's development program and boundaries. As discussed throughout this Addendum, the Proposed Project would not result in a new impact or a substantial increase in magnitude of the existing impacts.

b) CEQA Guidelines Section 15355, Cumulative Impacts, defines cumulative impacts as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. Cumulative impacts may result from individually minor, but collectively significant projects taking place over a period of time. As described in Section 4.3, *Development Program Consistency*, buildout of the Proposed Project, in addition to past and pending projects since certification of the 2021 LRDP EIR, is within the net new buildout analyzed in the 2021 LRDP EIR.

Section 5.1, *Environmental Evaluation of the Proposed Project*, of this Addendum includes an evaluation of the Proposed Project's potential cumulative impacts. As discussed throughout Section 5.1, the Proposed

Project would not create any new significant cumulative impacts. The Proposed Project would incrementally contribute to, but would not exceed, the cumulative impacts analyses in the 2021 LRDP EIR. Therefore, the Proposed Project would not be expected to contribute to significant cumulative impacts when considered along with other projects constructed under the 2021 LRDP.

c) Development under the Proposed Project would not change from the 2021 LRDP with respect to direct and indirect effects on human beings. The Proposed Project would not increase the 2021 LRDP's development program and boundaries. As discussed throughout this Addendum, the Proposed Project would not result in a new impact or a substantial increase in magnitude of existing impacts.

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6. Conclusion

As summarized below, and for the reasons described in Section 5, *Environmental Analysis*, of this Addendum, UC Berkeley has concluded that the Proposed Project would not result in any new significant impacts not previously identified in the 2021 LRDP EIR; nor would it result in a substantial increase in the severity of any significant environmental impact previously identified in the 2021 LRDP EIR. For these reasons, a subsequent EIR is not required, and an Addendum to the 2021 LRDP EIR is the appropriate CEQA document to address the Proposed Project.

6.1 SUBSTANTIAL CHANGES TO THE PROJECT

The Proposed Project is not a substantial change to the 2021 LRDP because it is within the study area described in the 2021 LRDP EIR in Section 3.4, *EIR Study Area*, and shown on Figure 3-2, *EIR Study Area*, and because it is within the buildout and population projections described and evaluated in Section 3.5.1.8, *Development Program*, of the 2021 LRDP EIR. Consequently, there are no substantial changes proposed to the 2021 LRDP that will require major revisions of the 2021 LRDP EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

6.2 SUBSTANTIAL CHANGES IN CIRCUMSTANCES

As described in Section 5, *Environmental Analysis*, of this Addendum, the Proposed Project would not result in new significant environmental impacts beyond those identified in the 2021 LRDP EIR, would not substantially increase the severity of significant environmental effects identified in the 2021 LRDP EIR, and thus would not require major revisions to the 2021 LRDP EIR. The Proposed Project, therefore, is not substantial and does not require major revisions to the 2021 LRDP EIR or preparation of a subsequent EIR. In addition, the physical conditions within the UC Berkeley campus have not changed substantially since the certification of the 2021 LRDP EIR, although some structures have been improved and others have been demolished.

6.3 NEW INFORMATION

No new information of substantial importance, which was not known and could not have been known when the 2021 LRDP EIR was certified in 2021, shows that the Proposed Project would be expected to result in: 1) new significant environmental effects not identified in the 2021 LRDP EIR; 2) substantially more severe environmental effects than shown in the 2021 LRDP EIR; 3) mitigation measures or alternatives previously determined to be infeasible that would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project sponsor declines to adopt the mitigation or alternative; or 4) mitigation measures or alternatives that are considerably different from those identified in the 2021

LRDP EIR that would substantially reduce one or more significant effects of the project, but the project sponsor declines to adopt the mitigation measure or alternative.

APPENDIX A

Applicable Program-Level Mitigation Measures and Continuing Best Practices

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Applicable Program-Level Mitigation Measures and Continuing Best Practices

The table below identifies mitigation measures and Continuing Best Practices (CBPs) from the 2021 LRDP EIR that are applicable to the Heathcock Hall Building Project.

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
Air Quality	Mitigation Measure	AIR-2.1	UC Berkeley shall use equipment that meets the United States Environmental Protection Agency Tier 4 Final emissions standards or higher for off-road diesel-powered construction equipment with more than 50 horsepower, unless it can be demonstrated to UC Berkeley that such equipment is not commercially available. For purposes of this mitigation measure, "commercially available" shall mean the availability of Tier 4 Final engines similar to the availability for other large-scale construction projects in the city occurring at the same time and taking into consideration factors such as (i) potential significant delays to critical-path timing of construction and (ii) geographic proximity to the project site of Tier 4 Final equipment. Where such equipment is not commercially available, as demonstrated by the construction contractor, Tier 4 interim equipment shall be used. Where Tier 4 interim equipment is not commercially available, as demonstrated by the contractor, Tier 3 equipment retrofitted with a California Air Resources Board's Level 3 Verified Diesel Emissions Control Strategy (VDECS) shall be used. The requirement to use Tier 4 Final equipment or higher for engines over 50 horsepower shall be identified in construction bids and the following shall also be completed: • Prior to construction, the project engineer shall ensure that all demolition and grading plans clearly show the requirement for United States Environmental Protection Agency Tier 4 Final or higher emissions standards for construction equipment over 50 horsepower. • During construction, the construction contractor shall maintain a list of all operating equipment in use over 20 hours on the construction site for verification by UC Berkeley. • The construction equipment list shall state the makes, models, and numbers of construction equipment on-site. • To the extent that equipment is available and cost-effective, contractors shall use electric, hybrid, or alternate-fueled off-road construction equipment. • Contractors shall use electric construction tools, such as saws, drills, and compressors, where grid electricity is available. • Construction activities shall be prohibited when the Air Quality Index (AQI), as measured by the closest Bay Area Air Quality Management District monitoring station (e.g., Berkeley Aquatic Center), is greater than 150 for particulates and ozone in the project area. • Contractors shall provide information on transit and ridesharing programs and services to construction employees.	2021 LRDP EIR Table 6-1, Mitigation Monitoring and Reporting Program for the Long Range Development Plan

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
			Additionally, meal options on-site and/or shuttles between the facility and nearby meal destinations for construction employees shall be provided.	
Air Quality	Mitigation Measure	AIR-2.2	To reduce Reactive Organic Gas emissions, for interior architectural coatings, UC Berkeley shall utilize certified (e.g., Greenguard or Green Seal) low-Volatile Organic Compound (VOC) paints or, when feasible, no-VOC paints (i.e., less than 5 grams per liter of VOC). UC Berkeley shall verify that the requirement to use low-VOC (and/or no-VOC) paints is identified in construction bids and on architectural plans.	2021 LRDP EIR Table 6-1, Mitigation Monitoring and Reporting Program for the Long Range Development Plan
Air Quality	Mitigation Measure	AIR-3.1	Construction projects subject to CEQA on sites one acre or greater, within 1,000 feet of residential and other sensitive land use projects (e.g., hospitals, schools, nursing homes, day care centers), as measured from the property line of the project to the property line of the source/edge of the sensitive land use, that utilize off-road equipment of 50 horsepower or more and, that occur for more than 12 months of active construction (i.e., exclusive of interior renovations), shall require preparation of a construction health risk assessment (HRA) prior to future discretionary project approval, as recommended in the current HRA Guidance Manual prepared by the California Office of Environmental Health Hazard Assessment (OEHHA). Additionally, UC Berkeley shall consider whether unusual circumstances warrant evaluation of construction health risk for projects with construction durations of less than 12 months or on development sites smaller than one acre. For example, unusual circumstances would include sites that require extensive site preparation with more than 10,000 cubic yards of excavation. The construction HRA shall generally be prepared in accordance with policies and procedures of the OEHHA and the Bay Area Air Quality Management District. The latest OEHHA guidelines shall be used for the analysis, including age sensitivity factors, breathing rates, and body weights appropriate for children ages 0 to 16 years. If the construction HRA shows that the incremental cancer risk exceeds 10 in a million (10E-06), PM2.5 concentrations exceed 0.3 µg/m3, or the appropriate noncancer hazard index exceeds 1.0, the construction HRA shall be required to identify all feasible measures capable of reducing potential cancer and noncancer risks to an acceptable level to the extent feasible (i.e., below 10 in a million, a hazard index of 1.0, or 0.3 µg/m3 of PM2.5), including appropriate enforcement mechanisms. Examples of feasible measures include use of U.S. Environmental Protection Agency rated Tier 4 construction equipment, diesel particulate filters, and electric equipment. The construction health risk assessment shall be submitted to UC Berkeley's Office of Environment, Health & Safety for review and approval. Measures identified in the health risk assessment shall be included in bid documents, purchase orders, contracts, and grading plans prepared for the development projects. Compliance with these measures shall be verified during regular construction site inspections.	2021 LRDP EIR Table 6-1, Mitigation Monitoring and Reporting Program for the Long Range Development Plan
Biological Resources	Mitigation Measure	BIO-4	Structures and buildings that are new or are taller than existing structures and buildings shall be designed to minimize the potential risk of bird collisions. This should at a minimum include the following design considerations	2021 LRDP EIR Table 6-1,

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
			and management strategies: (1) avoid the use of highly reflective glass as an exterior treatment, which appears to reproduce natural habitat and can be attractive to some birds; (2) limit reflectivity and prevent exterior glass from attracting birds in building plans by utilizing low-reflectivity glass and providing other non-attractive surface treatments; (3) use low-reflectivity glass or other bird safe glazing treatments for the majority of the building's glass surface, not just the lower levels; (4) for office and commercial buildings, interior light "pollution" should be reduced during evening hours through the use of a lighting control system programmed to shut off during non-work hours and between 10 p.m. and sunrise; (5) exterior lighting should be directed downward and screened to minimize illuminating the exterior of the building at night, except as needed for safety and security; (6) untreated glass skyways or walkways, freestanding glass walls, and transparent building corners should be avoided; (7) transparent glass should not be allowed at the rooflines of buildings, including in conjunction with green roofs; and (8) all roof mechanical equipment should preferably be covered by low-profile angled roofing or other treatments so that obstacles to bird flight are minimized. These strategies shall be incorporated at the direction of the Campus Architect during plan review, and the Campus Architect shall confirm the incorporation of these strategies into architectural plans prior to building construction. The Campus Architect shall incorporate additional strategies to avoid or reduce avian collisions that are indicated by the best available science.	Mitigation Monitoring and Reporting Program for the Long Range Development Plan
Cultural Resources	Mitigation Measure	CUL-1.1e	Implement Mitigation Measure NOI-2.	2021 LRDP EIR Table 6-1, Mitigation Monitoring and Reporting Program for the Long Range Development Plan
Cultural Resources	Mitigation Measure	CUL-2	For construction projects that include substantial ground-disturbing activities (including, but not limited to, soil removal, parcel grading, new utility trenching, and foundation-related excavation), UC Berkeley shall implement the following steps to ensure impacts to archaeological resources will be less than significant. • **All Projects with Ground-Disturbing Activities.** ○ Prior to soil disturbance, UC Berkeley shall confirm that contractors have been notified of the procedures for the identification of federal- or State-eligible cultural resources, and that the construction crews are aware of the potential for previously undiscovered archaeological resources or tribal cultural resources on site, of the laws protecting these resources and associated penalties, and of the procedures to follow should they discover cultural resources during project-related work. ○ If a resource is discovered during construction (whether or not an archaeologist is present), the following measures shall be implemented: - All soil disturbing work within 35 feet of the find shall cease. - UC Berkeley shall contact a qualified archaeologist to provide and implement a plan for survey, subsurface	2021 LRDP EIR Table 6-1, Mitigation Monitoring and Reporting Program for the Long Range Development Plan

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
			investigation as needed to define the deposit, and assessment of the remainder of the site within the project area to determine whether the resource is significant and would be affected by the project. - Any previously undiscovered resources found during construction activities shall be recorded on appropriate California Department of Parks and Recreation forms and evaluated for significance in terms of the California Environmental Quality Act (CEQA) criteria by a qualified archaeologist. - If the resource is a tribal cultural resource, the consulting archaeologist, approved by UC Berkeley in consultation with the appropriate tribe as determined by the Native American Heritage Commission, shall consult with the appropriate tribe to evaluate the significance of the resource and to recommend appropriate and feasible avoidance, testing, preservation or mitigation measures, in light of factors such as the significance of the find, proposed project design, costs, and other considerations. - If avoidance is infeasible, other appropriate measures (e.g., data recovery) may be implemented. - If the resource is a non-tribal resource determined significant under CEQA, a qualified archaeologist shall prepare and implement a research design and archaeological data recovery plan that will capture those categories of data for which the site is significant. - The archaeologist shall also perform appropriate technical analyses; prepare a comprehensive report complete with methods, results, and recommendations; and provide for the permanent curation of the recovered resources if appropriate. - The report shall be submitted to the relevant city (if it falls under Berkeley or Oakland boundaries), California Historic Resources Information System Northwest Information Center, and the State Historic Preservation Office, if required. • **Areas with High Archaeological Sensitivity.** In addition to the requirements above for all construction projects with ground-disturbing activities, for projects in areas with moderately high to extreme archaeological sensitivity (as shown on the confidential Figure 11, Prehistoric Cultural Sensitivity Overlay Analysis Results, prepared for the 2021 LRDP Update EIR) ground-disturbing activities shall be monitored from the outset. Monitoring shall occur for soil removal, parcel grading, new utility trenching, and foundation-related excavation in those areas that extend into previously undisturbed soils. If the resources are tribal, archaeological monitoring must be undertaken by a qualified archaeologist approved by UC Berkeley in consultation with the appropriate tribe as determined by the Native American Heritage Commission or the appropriate tribe, who is familiar with a wide range of prehistoric archaeological or tribal remains and is conversant in artifact identification, human and faunal bone, soil descriptions, and interpretation. Based on project-specific daily construction schedules, field conditions, and archaeological observations, full-time monitoring may not be warranted following initial observations. • **Sites with Known Archaeological Resources.** In the event the disturbance of a site with known archaeological or tribal cultural resources cannot be avoided, in addition to the requirements above for all construction projects with ground-disturbing activities, for project sites with known on-site archaeological or tribal cultural resources, the following additional actions shall be implemented prior to ground disturbance: ○ UC Berkeley, in consultation with the appropriate tribe, will retain a qualified archaeologist to conduct a	

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
			subsurface investigation of the project site, and to ascertain the extent of the deposit of any buried archaeological materials relative to the project's area of potential effects. The archaeologist shall prepare a site record and, upon tribal approval, it shall be filed with the California Historical Resource Information System. ○ If the resource extends into the project's area of potential effects, the resource shall be evaluated by a qualified archaeologist approved by UC Berkeley in consultation with the appropriate tribe. UC Berkeley shall consider this evaluation in determining whether the resource qualifies as a historical resource or a unique archaeological resource under the criteria of California Environmental Quality Act (CEQA) Guidelines Section 15064.5. - If the resource does not qualify, no further mitigation is required unless there is a discovery of additional resources during construction (as required above for all construction projects with ground-disturbing activities). - If a resource is determined to qualify as an historical resource or a unique archaeological resource in accordance with CEQA, UC Berkeley shall consult with the appropriate tribe (in the case of Native American sites) and a qualified archaeologist, approved by UC Berkeley in consultation with the appropriate tribe, to mitigate the effect through data recovery if appropriate to the resource or, if data recovery is infeasible, to consider means of avoiding or reducing ground disturbance within the site boundaries, including where and if feasible, minor modifications of building footprint, landscape modification, the placement of protective fill, the establishment of a preservation easement, or other means that would permit avoidance or substantial preservation in place of the resource. A written report of the results of investigations shall be prepared by a qualified archaeologist and, upon tribal approval, filed with the University Archives/ Bancroft Library and the California Historic Resources Information System Northwest Information Center.	
Geology and Soils	Mitigation Measure	GEO-5	For ground-disturbing activities within highly sensitive geologic formations (i.e., Franciscan Assemblage, Great Valley Sequence, Orinda Formation, Claremont Chert, unnamed mudstone, or older alluvium, as shown on Figure 5.6-1, Geologic Map, of the 2021 LRDP Update EIR), if pre-construction testing does not take place, ground-disturbing activities shall implement the following measures. "Ground-disturbing activities" shall include soil removal, parcel grading, utility trenching, and foundation-related excavation in those areas that extend into previously undisturbed soils. ● UC Berkeley shall provide a paleontological resources awareness training program to all construction personnel active on the project site during earth moving activities. The first training will be provided prior to the initiation of ground-disturbing activities by a qualified paleontologist. The program will include relevant information regarding fossils and fossil-bearing formations that may be encountered. The training will also describe appropriate avoidance and minimization measures for resources that have the potential to be located on the project site. ● If any paleontological resources are encountered during ground-disturbing activities, the contractor shall ensure that activities in the immediate area of the find are halted and that UC Berkeley is informed. UC Berkeley shall retain a qualified paleontologist to evaluate the discovery and recommend appropriate treatment options pursuant to guidelines developed by the Society of Vertebrate Paleontology, including development and implementation of a paleontological resource impact mitigation program by a qualified paleontologist for treatment of the particular resource, if applicable. These measures may include, but not be limited to the following:	2021 LRDP EIR Table 6-1, Mitigation Monitoring and Reporting Program for the Long Range Development Plan

<table>
<tr><th>Topic</th><th>Type of Measure</th><th>Mitigation/ CBP #</th><th>Mitigation/Continuing Best Practice Text</th><th>Source Document</th></tr>
<tr><td></td><td></td><td></td><td>○ salvage of unearthed fossil remains and/or traces (e.g., tracks, trails, burrows);
○ screen washing to recover small specimens;
○ preparation of salvaged fossils to a point of being ready for curation (e.g., removal of enclosing matrix, stabilization and repair of specimens, and construction of reinforced support cradles); and
○ identification, cataloging, curation, and provision for repository storage of prepared fossil specimens.</td><td></td></tr>
<tr><td>Noise</td><td>Mitigation Measure</td><td>NOI-2</td><td>If any vibration causing construction activities/equipment are anticipated to be used for future development projects, UC Berkeley shall implement the following steps to ensure impacts from vibration causing construction activities/equipment will be less than significant.
• Step 1 (Activity/Equipment Screening Distances): UC Berkeley shall use the construction vibration screening standards shown below based on Federal Transit Administration criteria to determine if the construction activity/equipment is within the vibration screening distances that could cause building damage/human annoyance or sensitive equipment disturbance. If the construction activity/equipment is within the screening distance, then Step 2 (Alternative Methods/Equipment) shall be implemented.

<table>
<tr><th colspan="4">Screening Distances to PPV in/sec Threshold: Building Damage</th></tr>
<tr><th>Activity/Equipment</th><th>Reference Vibration Levels (in/sec PPV) at 25 feet</th><th>Screening Level Distance in feet for 0.20 in/sec PPV [a]</th><th>Screening Level Distance in feet for 0.12 in/sec PPV [b]</th></tr>
<tr><td>Pile Driving</td><td>1.518</td><td>97</td><td>136</td></tr>
<tr><td>Caisson Drilling</td><td>0.089</td><td>15</td><td>21</td></tr>
<tr><td>Vibratory Roller</td><td>0.21</td><td>26</td><td>37</td></tr>
<tr><td>Large Bulldozer</td><td>0.089</td><td>15</td><td>21</td></tr>
<tr><th colspan="4">Screening Distance to VdB Threshold: Human Annoyance and Sensitive Equipment Disturbance</th></tr>
<tr><th>Activity/Equipment</th><th>Reference Vibration Levels (VdB) at 25 feet</th><th>Screening Level Distance in feet for 72 VdB [c]</th><th>Screening Level Distance in feet for 65 VdB [d]</th></tr>
<tr><td>Pile Driving</td><td>112</td><td>520</td><td>890</td></tr>
<tr><td>Caisson Drilling</td><td>87</td><td>80</td><td>140</td></tr>
<tr><td>Vibratory Roller</td><td>94</td><td>140</td><td>240</td></tr>
<tr><td>Large Bulldozer</td><td>87</td><td>80</td><td>140</td></tr>
</table>
Notes: Peak Particle Velocity inches per second (PPV in/sec); Vibration Decibel (VdB).
a. FTA Building Category III, Non-engineered timber and masonry buildings (residential).
b. FTA Building Category IV, Buildings extremely susceptible to vibration damage (historic).
c. FTA Land Use Category 2, Residences and buildings where people normally sleep.
d. FTA Land Use Category 1, Buildings where vibration would interfere with interior operations.
Source: Federal Transit Administration, 2018, Transit Noise and Vibration Impact Assessment.</td><td>2021 LRDP EIR Table 6-1, Mitigation Monitoring and Reporting Program for the Long Range Development Plan</td></tr>
</table>

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
			• **Step 2 (Alternative Methods/Equipment):** When the anticipated vibration-causing construction activity/equipment is within the screening standards in Step 1 (Activity/Equipment Screening Distances), UC Berkeley shall consider whether alternative methods/equipment are available and shall verify that the alternative method/equipment is shown on the construction plans prior to the beginning of construction. Alternative methods/equipment may include, but are not limited to: ○ For pile driving, the use of caisson drilling (drill piles), vibratory pile drivers, oscillating or rotating pile installation methods, pile pressing, "silent" piling, and jetting or partial jetting of piles into place using a water injection at the tip of the pile shall be used, where feasible. ○ For paving, use of a static roller in lieu of a vibratory roller shall be implemented. ○ For grading and earthwork activities, off-road equipment shall be limited to 100 horsepower or less. Where alternative methods/equipment to vibration causing activities/equipment are not feasible, then Step 3 (Construction Vibration Monitoring Program) shall be implemented. • **Step 3 (Construction Vibration Monitoring Program):** Prior to any project-related excavation, demolition or construction activity for projects within the screening distances listed in Step 1 (Activity/Equipment Screening Distances) and where alternative methods/equipment to vibration causing activities/equipment are not feasible pursuant to Step 2 (Alternative Methods/Equipment), UC Berkeley shall prepare a construction vibration monitoring program. The program shall be prepared and implemented by a qualified acoustical consultant or structural engineer. Where the vibration sensitive receptors are historic resources, the program shall be prepared and implemented by a structural engineer with a minimum of five years of experience in the rehabilitation and restoration of historic buildings and a historic preservation architect meeting the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, Professional Qualifications Standards. The program shall include the following: ○ Prepare an existing conditions study to establish the baseline condition of the vibration sensitive resources in the form of written descriptions with a photo survey, elevation survey, and crack-monitoring survey for the vibration-sensitive building or structure. The photo survey shall include internal and external crack monitoring in the structure, settlement, and distress, and document the condition of the foundation, walls and other structural elements in the interior and exterior of the building or structure. Surveys will be performed prior to, in regular intervals during, and after completion of all vibration-generating activity. Where receptors are historic resources, the study shall describe the physical characteristics of the resources that convey their historic significance. ○ Determine the number, type, and location of vibration sensors and establish a vibration velocity limit (as determined based on a detailed review of the proposed building), method (including locations and instrumentation) for monitoring vibrations during construction, and method for alerting responsible persons who have the authority to halt construction should limits be exceeded or damaged observed. ○ Perform monitoring surveys prior to, in regular intervals during, and after completion of all vibration-generating activity and report any changes to existing conditions, including, but not limited to, expansion of existing cracks, new spalls, other exterior deterioration, or any problems with character-defining features of a historic resource are	

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
			discovered. UC Berkeley shall establish the frequency of monitoring and reporting, based upon the recommendations of the qualified acoustical consultant or structural engineer or if there are historic buildings, the historic architect and structural engineer. Monitoring reports shall be submitted to UC Berkeley's designated representative responsible for construction activities. ○ Develop a vibration monitoring and construction contingency plan, which shall identify where monitoring would be conducted, establish a vibration monitoring schedule, define structure-specific vibration limits, and require photo, elevation, and crack surveys to document conditions before and after demolition and construction activities. Construction contingencies would be identified for when vibration levels approach the limits. If vibration levels approach limits, suspend construction and implement contingencies to either lower vibration levels or secure the affected structure. ○ Report substantial adverse impacts to vibration sensitive buildings including historic resources related to construction activities that are found during construction to UC Berkeley's designated representative responsible for construction activities. UC Berkeley's designated representative shall adhere to the monitoring team's recommendations for corrective measures, including halting construction or using different methods, in situations where demolition, excavation/construction activities would imminently endanger historic resources. UC Berkeley's designated representative would respond to any claims of damage by inspecting the affected property promptly, but in no case more than five working days after the claim was filed and received by UC Berkeley's designated representative. Any new cracks or other damage to any of the identified properties will be compared to pre-construction conditions and a determination made as to whether the proposed project could have caused such damage. In the event that the project is demonstrated to have caused any damage, such damage would be repaired to the pre-existing condition. Site visit reports and documents associated with claims processing would be provided to the relevant government body with jurisdiction over the neighboring historic resource, as necessary. ○ Conduct a post-survey on the structure where either monitoring has indicated high levels or complaints of damage and make appropriate repairs where damage has occurred as a result of construction activities. ○ Prepare a construction vibration monitoring report that summarizes the results of all vibration monitoring and submit the report after the completion of each phase identified in the project construction schedule. The vibration monitoring report shall include a description of measurement methods, equipment used, calibration certificates, and graphics as required to clearly identify vibration-monitoring locations. An explanation of all events that exceeded vibration limits shall be included together with proper documentation supporting any such claims. The construction vibration monitoring report shall be submitted to UC Berkeley within two weeks upon completion of each phase identified in the project construction schedule. ○ Designate a person responsible for registering and investigating claims of excessive vibration. The contact information of such person shall be clearly posted in one or more locations at the construction site	
Cultural Resources	Mitigation Measure	TCR-1	Implement Mitigation Measure CUL-2.	2021 LRDP EIR Table 6-1,

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
				Mitigation Monitoring and Reporting Program for the Long Range Development Plan
Wildfire	Mitigation Measure	WF-3	Electrical lines associated with future electrical infrastructure shall be undergrounded, where feasible. UC Berkeley shall verify compliance with this measure as part of plan review prior to construction.	2021 LRDP EIR Table 6-1, Mitigation Monitoring and Reporting Program for the Long Range Development Plan
Aesthetics	Continuing Best Practice	AES-1	New projects will as a general rule conform to the Physical Design Framework. While the guidelines in the Physical Design Framework would not preclude alternate design concepts when such concepts present the best solution for a particular site, UC Berkeley will not depart from the Physical Design Framework except for solutions of extraordinary quality.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Aesthetics	Continuing Best Practice	AES-2	Major new campus projects will continue to be reviewed at each stage of design by the UC Berkeley Design Review Committee. The provisions of the LRDP, as well as project-specific design guidelines prepared for each such project, will guide these reviews.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Aesthetics	Continuing Best Practice	AES-6	Lighting for new development projects will be designed to include shields and cut-offs that minimize light spillage onto unintended surfaces and minimize atmospheric light pollution. The only exception to this principle will be in those areas where such features would be incompatible with the visual and/or historic character of the area.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Aesthetics	Continuing Best Practice	AES-7	As part of UC Berkeley's design review procedures, light and glare will be given specific consideration and measures will be incorporated into the project design to minimize both. In general, exterior surfaces will not be reflective; architectural screens and shading devices are preferable to reflective glass.	2021 LRDP EIR Table 7-1, Continuing Best Practices

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
				Implementation and Monitoring
Air Quality	Continuing Best Practice	AIR-2	UC Berkeley will continue to comply with the current Bay Area Air Quality Management District basic control measures for fugitive dust control. The requirement to comply with the basic control measures will be identified in construction bids. The Bay Area Air Quality Management District's current basic control measures include: • Water all active construction areas at least twice daily, or as often as needed to control dust emissions. Watering should be sufficient to prevent airborne dust from leaving the site. Increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water will be used whenever possible. • Pave, apply water twice daily or as often as necessary to control dust, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer). • Sweep daily (with water sweepers using reclaimed water if possible) or as often as needed all paved access roads, parking areas and staging areas at the construction site to control dust. • Sweep public streets daily (with water sweepers using reclaimed water if possible) in the vicinity of the project site, or as often as needed, to keep streets free of visible soil material. • Hydroseed or apply nontoxic soil stabilizers to inactive construction areas. • Enclose, cover, water twice daily, or apply nontoxic soil binders to exposed stockpiles (dirt, sand, etc.). • Limit vehicle traffic speeds on unpaved roads to 15 miles per hour. • Replant vegetation in disturbed areas as quickly as possible.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Air Quality	Continuing Best Practice	AIR-3	UC Berkeley will continue to implement the following control measures to reduce emissions of diesel particulate matter and ozone precursors from construction equipment exhaust: • Equipment will be properly serviced and maintained in accordance with the manufacturer's recommendations. • Construction contractors will also ensure that all nonessential idling of construction equipment is restricted to five minutes or less, in compliance with Section 2449 of the California Code of Regulations, Title 13, Article 4.8, Chapter 9.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Biological Resources	Continuing Best Practice	BIO-1	Avoid disturbance or removal of bird nests protected under the federal Migratory Bird Treaty Act and California Department of Fish and Game Code when in active use. This will be accomplished by taking the following steps. • If tree removal and initial construction is proposed during the nesting season (February 1 to August 31), a focused survey for nesting raptors and other migratory birds will be conducted by a qualified biologist within 14 days prior to the onset of tree and vegetation removal in order to identify any active nests on the site and surrounding area within up to 500 feet of proposed construction, with the distance to be determined by a qualified biologist based on project location. The site will be resurveyed to confirm that no new nests have been established if vegetation removal and demolition has not been completed or if construction has been delayed or stopped for more than seven consecutive days during the nesting season.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
			• If no active nests are identified during the construction survey period, or development is initiated during the non-breeding season (September 1 to January 31), tree and vegetation removal and building construction may proceed with no restrictions. • If bird nests are found, an adequate setback will be established around the nest location and vegetation removal, building demolition, and other construction activities shall be restricted within this no-disturbance zone until the qualified biologist has confirmed that birds have either not begun egg-laying and incubation, or that the juveniles from those nests are foraging independently and capable of survival outside the nest location. Required setback distances for the no-disturbance zone will be based on input received from the California Department of Fish and Wildlife and may vary depending on species and sensitivity to disturbance. As necessary, the no-disturbance zone will be fenced with temporary orange construction fencing if construction is to be initiated on the remainder of the site. • A report of findings will be prepared by the qualified biologist and submitted to the UC Berkeley's Office of Physical & Environmental Planning for review and approval prior to initiation of vegetation removal, building demolition and other construction activities during the nesting season. The report will either confirm absence of any active nests or confirm that any young are located within a designated no-disturbance zone and construction can proceed. No report of findings is required if vegetation removal and other construction activities are initiated during the non-nesting season and continue uninterrupted according to the above criteria.	
Biological Resources	Continuing Best Practice	BIO-9	Adverse effects to specimen trees and plants will be avoided. UC Berkeley will continue to implement the Campus Specimen Tree Program to reduce effects to specimen trees and flora. Replacement landscaping will be provided where specimen resources are adversely affected, either through salvage and transplanting of existing trees and shrubs or through new horticulturally appropriate replacement plantings, as directed by the Campus Landscape Architect.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Biological Resources	Continuing Best Practice	BIO-10	Implementation of the recommendations of the Landscape Master Plan and subsequent updates, and project-specific design guidelines, will provide for stewardship of existing landscaping, and use of replacement and expanded tree and shrub plantings to improve the important open space characteristics and resilience of the Campus Park. Native plantings and horticulturally appropriate species will continue to be used in future landscaping, serving to partially replace any trees lost as a result of development.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Biological Resources	Continuing Best Practice	BIO-11	Trees and other vegetation require routine maintenance. As trees age and become senescent, UC Berkeley will continue to undertake trimming, thinning, or removal, particularly if trees become a safety hazard. Vegetation in the Hill Campus East requires continuing management for fire safety, emergency evacuation, habitat enhancement, and other objectives. This may include removal of mature trees such as native live oaks and non-native plantings of eucalyptus and pine. The Landscape Master Plan, Landscape Heritage Plan and their subsequent updates will provide guidance on potential species to replace trees that are removed, where appropriate.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
Cultural Resources	Continuing Best Practice	CUL-1	UC Berkeley will follow the procedures of conduct following the discovery of human remains that have been mandated by Health and Safety Code Section 7050.5, Public Resources Code Section 5097.98 and the California Code of Regulations Section 15064.5(e) (California Environmental Quality Act [CEQA]). According to the provisions in CEQA, if human remains are encountered at the site, all work in the immediate vicinity of the discovery shall cease and necessary steps to ensure the integrity of the immediate area shall be taken. The County Coroner shall be notified immediately. The Coroner shall then determine whether the remains are Native American. If the Coroner determines the remains are Native American, the Coroner shall notify the California Native American Heritage Commission (NAHC) within 24 hours, who will, in turn, notify the person the NAHC identifies as the Most Likely Descendant (MLD) of any human remains. Further actions shall be determined, in part, by the desires of the MLD. The MLD has 48 hours to make recommendations regarding the disposition of the remains following notification from the NAHC of the discovery. If the NAHC is unable to identify an MLD, the MLD fails to make a recommendation within 48 hours after being notified, or the landowner rejects the recommendation of the MLD, and mediation by the NAHC fails to provide measures acceptable to the landowner, the owner shall, with appropriate dignity, reinter the remains in an area of the property secure from further disturbance.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Geology and Soils	Continuing Best Practice	GEO-1	UC Berkeley will continue to comply with the California Building Code and the University of California Seismic Safety Policy.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Geology and Soils	Continuing Best Practice	GEO-2	Site-specific geotechnical studies will be conducted under the supervision of a California Registered Certified Engineering Geologist or licensed geotechnical engineer and UC Berkeley will incorporate recommendations for geotechnical hazard prevention and abatement into project design.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Geology and Soils	Continuing Best Practice	GEO-3	The UC Berkeley Seismic Review Committee will continue to review all seismic and structural engineering design for new and renovated existing buildings on campus.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Geology and Soils	Continuing Best Practice	GEO-4	UC Berkeley will continue to use site-specific seismic ground motions for analysis and design of campus projects. Site-specific ground motions provide more current geo-seismic data than the U.S. Geological Survey (USGS) and are used for performance-based analyses.	2021 LRDP EIR Table 7-1, Continuing Best

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
				Practices Implementation and Monitoring
Geology and Soils	Continuing Best Practice	GEO-6	UC Berkeley will continue to implement programs and projects in emergency planning, training, response, and recovery. Each campus Building Coordinator will prepare, and update as needed, building response plans and coordinate education and planning for all building occupants.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Geology and Soils	Continuing Best Practice	GEO-7	As stipulated in the UC Seismic Safety Policy, the design parameters for specific site peak acceleration and structural reinforcement will be determined by the geotechnical and structural engineer for each new or rehabilitation project proposed under the LRDP. The acceptable level of actual damage that could be sustained by specific structures will be calculated based on geotechnical information obtained at the specific building site.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Geology and Soils	Continuing Best Practice	GEO-8	Site-specific geotechnical studies will include an assessment of landslide hazard, including seismic vibration and other factors contributing to slope stability.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Geology and Soils	Continuing Best Practice	GEO-9	Campus construction projects must comply with the Campus Design Standards, which contain regulatory and other campus requirements for construction-phase and post-construction stormwater management.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Geology and Soils	Continuing Best Practice	GEO-10	In the event that a unique paleontological resource is identified during project planning or construction, the work will stop immediately in the area of effect, and the find will be protected until its significance can be determined by a qualified paleontologist. If the resource is determined to be a "unique resource," a mitigation plan will be formulated pursuant to guidelines developed by the Society of Vertebrate Paleontology and implemented to appropriately protect the significance of the resource by preservation, documentation, and/or removal, prior to recommencing activities in the area of effect. The plan will be prepared by the qualified paleontologist and submitted to the UC Berkeley project manager for review and approval prior to initiation or recommencement of construction activities in the area of effect.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
Hazards and Hazardous Materials	Continuing Best Practice	HAZ-1	UC Berkeley will continue to implement the same (or equivalent) health and safety plans, programs, practices, and procedures related to the use, storage, disposal, or transportation of hazardous materials and wastes (including chemical, radioactive, and biohazardous materials and waste) during the LRDP planning horizon. These include, but are not limited to: • Requirements for safe transportation of hazardous materials • UC Berkeley Office of Environment, Health & Safety training programs and oversight • The Hazard Communication Program • Publication and promulgation of the Water Protection Policy, the drain disposal guidelines, the Wastewater Toxics Management Plan, and the Slug Control Plan • Requirements that laboratories have Chemical Hygiene Plans and a chemical inventory database • The Aboveground Storage Tank Spill Prevention Control and Countermeasure Plan and monitoring of underground storage tanks • Implementation of the hazardous waste disposal program and policies • The Green Labs Program • The Biosafety Program • The Medical Waste Management Program • The Laser Safety Program • The Radiation Safety Program • The Drain Disposal Restrictions These programs may be subject to modification as regulations or UC Berkeley policies are developed or if the programs become obsolete through replacement by other programs that incorporate similar or more effective health and safety protection measures. However, any modifications must incorporate similar or more effective health and safety protection measures.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Hazards and Hazardous Materials	Continuing Best Practice	HAZ-3	UC Berkeley will continue to implement the same (or equivalent) programs related to transgenic materials use during the LRDP planning horizon, including, but not necessarily limited to, compliance with the National Institute of Health Guidelines for Research Involving Recombinant DNA Molecules, United States Department of Agriculture requirements for open-field-based research involving transgenic plants, and requiring registration with the UC Berkeley Office of Environment, Health & Safety for all research involving transgenic plants. These programs may be subject to modification as more stringent standards are developed or if the programs become obsolete through replacement by other programs that incorporate similar or more effective health and safety protection measures.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Hazards and Hazardous Materials	Continuing Best Practice	HAZ-5	UC Berkeley will continue to perform site histories and due diligence assessments of all sites where ground-disturbing construction is proposed, to assess the potential for soil and groundwater contamination resulting from past or current site land uses at the site or in the vicinity. The investigation will include review of regulatory records, historical maps and other historical documents, and inspection of current site conditions. UC Berkeley will act to protect the health and safety of workers or others potentially exposed should hazardous site conditions be found.	2021 LRDP EIR Table 7-1, Continuing Best Practices

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
				Implementation and Monitoring
Hydrology and Water Quality	Continuing Best Practice	HYD-1	During the plan check review process and construction phase monitoring, UC Berkeley Office of Environment, Health & Safety will review each development project to determine whether project runoff would increase pollutant loading and verify that the proposed project complies with all applicable requirements (e.g., Regional Water Quality Control Board and Campus Design Standards requirements) and best management practices (e.g., those described in the California Stormwater Quality Association's Construction BMP Handbook).	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Hydrology and Water Quality	Continuing Best Practice	HYD-2	UC Berkeley will continue implementing an urban runoff management program containing best management practices, as published in the Strawberry Creek Management Plan, and as developed through the Stormwater Permit Annual Reports completed for the Phase II municipal separate storm sewer system (MS4) permit. UC Berkeley will continue to comply with the MS4 stormwater permitting requirements by implementing construction and post-construction control measures and best management practices required by project-specific Stormwater Pollution Prevention Plans (SWPPPs) and by the Phase II MS4 permit to control pollution. SWPPPs will be prepared by the project contractor as required to prevent discharge of pollutants and to minimize sedimentation resulting from construction and the transport of soils by construction vehicles.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Hydrology and Water Quality	Continuing Best Practice	HYD-5	Landscaped areas of development sites will be designed to absorb runoff from rooftops and walkways. Open or porous paving systems will be included in project designs, where feasible, to minimize impervious surfaces and absorb runoff.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Hydrology and Water Quality	Continuing Best Practice	HYD-6	UC Berkeley will continue to develop and implement the recommendations of the Strawberry Creek Management Plan and its updates, and construct improvements as appropriate. These recommendations include, but are not limited to, minimization of the amount of land exposed at any one time during construction as feasible; use of temporary vegetation or mulch to stabilize critical areas where construction staging activities must be carried out prior to permanent cover of exposed lands; installation of permanent vegetation and erosion control structures as soon as practical; protection and retention of natural vegetation; and implementation of post-construction structural and non-structural water quality control techniques.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Hydrology and Water Quality	Continuing Best Practice	HYD-7	UC Berkeley will continue to review each development project, to determine whether rainwater infiltration to groundwater is affected. If it is determined that existing infiltration rates would be adversely affected, UC Berkeley will design and implement the necessary improvements to retain and infiltrate stormwater. Such improvements could include retention basins to collect and retain runoff, grassy swales, infiltration galleries, planter boxes, permeable pavement, or other retention methods. The goal of the improvement should be to ensure that there is no net decrease in the amount of water recharged to groundwater that serves as freshwater replenishment to	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
			Strawberry Creek. The improvement should maintain the volume of flows and times of concentration from any given site at pre-development conditions.	
Hydrology and Water Quality	Continuing Best Practice	HYD-8	Dewatering, when needed, will be monitored and maintained by qualified engineers in compliance with the Campus Design Standards and applicable regulations.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Hydrology and Water Quality	Continuing Best Practice	HYD-13	UC Berkeley will continue to manage runoff into storm drain systems such that the aggregate effect of projects implemented pursuant to the LRDP creates no net increase in runoff over existing conditions.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Land Use and Planning	Continuing Best Practice	LU-1	New projects in the Campus Park will, as a general rule, conform to the Physical Design Framework. The Physical Design Framework includes specific provisions to ensure projects at the city interface consider the transition from campus to city.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Noise	Continuing Best Practice	NOI-1	Mechanical equipment selection and building design shielding will be used, as appropriate, so that noise levels from future building operations would not exceed the City of Berkeley Noise Ordinance limits for commercial areas or residential zones as measured on any commercial or residential property in the area surrounding a project proposed to implement the LRDP. Controls typically incorporated to attain this outcome include selection of quiet equipment, sound attenuators on fans, sound attenuator packages for cooling towers and emergency generators, acoustical screen walls, and equipment enclosures.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Noise	Continuing Best Practice	NOI-2	UC Berkeley will require the following measures for all construction projects: • Construction activities will be limited to a schedule that minimizes disruption to uses surrounding the project site as much as possible. Construction outside the Campus Park will be scheduled within the allowable construction hours designated in the noise ordinance of the local jurisdiction to the full feasible extent, and exceptions will be avoided except where necessary. As feasible, construction equipment will be required to be muffled or controlled. • The intensity of potential noise sources will be reduced where feasible by selection of quieter equipment (e.g., gas or electric equipment instead of diesel powered, low noise air compressors). • Functions such as concrete mixing and equipment repair will be performed off-site whenever possible. • Stationary equipment such as generators and air compressors will be located as far as feasible from nearby noise-	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
			sensitive uses. ● At least 10 days prior to the start of construction activities, a sign will be posted at the entrance(s) to the job site, clearly visible to the public, that includes contact information for UC Berkeley's authorized representative in the event of a noise or vibration complaint. If the authorized contractor's representative receives a complaint, they will investigate, take appropriate corrective action, and report the action to UC Berkeley. ● During the entire active construction period and to the extent feasible, the use of noise-producing signals, including horns, whistles, alarms, and bells, will be for safety warning purposes only. The construction manager will use smart back-up alarms, which automatically adjust the alarm level based on the background noise level, or switch off back-up alarms and replace with human spotters in compliance with all safety requirements and laws. For projects requiring pile driving: ● With approval of the project structural engineer, pile holes will be pre-drilled to minimize the number of impacts necessary to seat the pile. ● Pile driving will be scheduled to have the least impact on nearby sensitive receptors. ● Pile drivers with the best available noise control technology will be used. For example, pile driving noise control may be achieved by shrouding the pile hammer point of impact, by placing resilient padding directly on top of the pile cap, and/or by reducing exhaust noise with a sound-absorbing muffler. ● Alternatives to impact hammers, such as oscillating or rotating pile installation systems, will be used where feasible.	
Transportation	Continuing Best Practice	TRAN-1	UC Berkeley will implement bicycle, pedestrian, and transit access and circulation improvements as part of new building projects, major renovations, and landscape projects. Improvements will address the goal of increasing non-vehicular commuting and safety; improving access from adjacent campus or city streets and public transit; reducing multi-modal conflict; providing bicycle parking; and providing commuter amenities.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Transportation	Continuing Best Practice	TRAN-4	UC Berkeley will continue to work with the City of Berkeley, AC Transit, and BART to coordinate transit access to new academic buildings, parking facilities, and campus housing projects, in order to accommodate changing locations or added demand.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Transportation	Continuing Best Practice	TRAN-5	UC Berkeley will require contractors working on major new construction or major renovation projects to develop and implement a Construction Traffic Management Plan that reduces construction-period impacts on circulation and parking within the vicinity of the project site. The Construction Traffic Management Plan will address job-site access, vehicle circulation, bicycle and pedestrian safety, and be coordinated with the City of Berkeley Public Works Department when projects require temporary modifications to city streets.	2021 LRDP EIR Table 7-1, Continuing Best Practices

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
				Implementation and Monitoring
Transportation	Continuing Best Practice	TRAN-6	For each construction project, UC Berkeley will require the prime contractor to prepare a Construction Traffic Management Plan which will include the following elements: • Proposed truck routes to be used, consistent with the City truck route map. • Construction hours, including limits on the number of truck trips during the morning (AM) and evening (PM) peak traffic periods (7:00 to 9:00 a.m. and 4:00 to 6:00 p.m.), if conditions demonstrate the need. • Proposed employee parking plan (number of spaces and planned locations). • Proposed construction equipment and materials staging areas, demonstrating minimal conflicts with circulation patterns. • Expected traffic detours needed, planned duration of each, and traffic control plans for each. • Identifying bicycle and pedestrian detours and safety plan, including solutions to address impacts to accessible routes.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Transportation	Continuing Best Practice	TRAN-7	UC Berkeley will manage project schedules to minimize the overlap of excavation or other heavy truck activity periods that have the potential to combine impacts on traffic loads and street system capacity, to the extent feasible.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Transportation	Continuing Best Practice	TRAN-8	UC Berkeley will reimburse the City of Berkeley for its fair share of costs associated with damage to City streets from UC Berkeley construction activities, provided that the City adopts a policy for such reimbursements applicable to all development projects within Berkeley.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Utilities and Service Systems	Continuing Best Practice	USS-1	For development that increases water demand, UC Berkeley will continue to evaluate the size of existing distribution lines as well as pressure of the specific feed affected by development on a project-by-project basis, and necessary improvements will be incorporated into the scope of work for each project to maintain current service and performance levels. The design of the water distribution system, including fire flow, for new buildings will be coordinated among UC Berkeley, the East Bay Municipal Utility District, and the City of Berkeley Public Works Department and Fire Department.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Utilities and Service Systems	Continuing Best Practice	USS-3	UC Berkeley will continue to incorporate specific water conservation measures into project design to reduce water consumption and wastewater generation. This could include the use of special air-flow aerators, water-saving shower heads, flush cycle reducers, low-volume toilets, weather-based or evapotranspiration irrigation controllers, drip	2021 LRDP EIR Table 7-1, Continuing Best Practices

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
			irrigation systems, and the use of drought resistant plantings in landscaped areas, and collaboration with the East Bay Municipal Utility District to explore suitable uses of recycled water.	Implementation and Monitoring
Utilities and Service Systems	Continuing Best Practice	USS-4	UC Berkeley will analyze water and sewer systems on a project-by-project basis to determine specific capacity considerations for both UC Berkeley systems and off-site municipal systems in the planning of any project proposed under the LRDP.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Utilities and Service Systems	Continuing Best Practice	USS-5	Payments to service providers to help fund wastewater treatment or collection facilities will conform to Section 54999 of the California Government Code, including, but not limited to, the following provisions: • Fees will be limited to the cost of capital construction or expansion. • Fees will be imposed only after an agreement has been negotiated by UC Berkeley and the service provider. • The service provider must demonstrate the fee is nondiscriminatory: i.e. the fee must not exceed an amount determined on the basis of the same objective criteria and methodology applied to comparable nonpublic users, and must not exceed the proportionate share of the cost of the facilities of benefit to the entity property being charged, based upon the proportionate share of use of those facilities. The service provider must demonstrate the amount of the fee does not exceed the amount necessary to provide capital facilities for which the fee is charged.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Utilities and Service Systems	Continuing Best Practice	USS-6	UC Berkeley will continue to implement the Zero Waste requirements of the UC Sustainability Policy designed to reduce the total quantity of campus solid waste that is disposed of in landfills.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Utilities and Service Systems	Continuing Best Practice	USS-7	In accordance with the CalGreen Code, and as required for Leadership in Energy and Environmental Design certification, contractors working for UC Berkeley will be required under their contracts to report their solid waste diversion according to UC Berkeley's waste management reporting requirements.	2021 LRDP EIR Table 7-1, Continuing Best Practices Implementation and Monitoring
Wildfire	Continuing Best Practice	WF-3	UC Berkeley will continue to plan and implement programs to reduce risk of wildland fires, including plan review and construction inspection programs that ensure that its projects incorporate fire prevention measures.	2021 LRDP EIR Table 7-1, Continuing Best Practices

Topic	Type of Measure	Mitigation/ CBP #	Mitigation/Continuing Best Practice Text	Source Document
				Implementation and Monitoring

APPENDIX B

Construction Health Risk Assessment

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1. Construction Health Risk Assessment

1.1 INTRODUCTION

On July 22, 2021, the Board of Regents of the University of California (the Regents) certified the University of California (UC), Berkeley 2021 Long Range Development Plan (LRDP Update) and Housing Projects #1 and #2 Environmental Impact Report (EIR), State Clearinghouse (SCH) No. 2020040078. The programmatic LRDP Update evaluated a development program for up to 8,096,249 square feet of new building space for residential, academic life, campus life, and parking facilities and 11,731 new beds. The two housing projects were approved by the Regents on July 22, 2021 and September 30, 2021, respectively. Together the LRDP Update and Housing Projects #1 and #2 and the 2021 EIR, including any subsequent addenda, are considered the "Evaluated Project" and the "Certified EIR," respectively.

The University of California Berkeley (UC Berkeley or the university) proposes to develop the New Chemistry Building Project (Heathcock Hall or Proposed Project) in the southeast quadrant of the UC Berkeley Campus Park in the City of Berkeley, Alameda County, California. The New Chemistry Building will be located across Gayley Road from the Greek Theatre, in the area generally bounded by University Drive to the north, Gayley Road to the east, Latimer Hall to the west and Lewis Hall to the south. Currently, the Proposed Project site is predominantly a landscaped area with a walking path and also includes a bridge structure connecting Lewis Hall to the south and Latimer Hall to the west. As part of the Project, paving improvements will be made to the intersection of Gayley Road and University Drive, and new ADA parking stalls will be added east of Gayley Road across from Stanley Hall. The Proposed Project was included in the Certified EIR as a potential redevelopment project as project CP1 and conceptually planned for 143,000 square feet (SF) of academic life space.

The Certified EIR concluded construction-related health risk impacts associated with the LRDP Update are considered significant and unavoidable at the program level, and included the following mitigation measure:

> **Mitigation Measure AIR-3.1:** Construction of projects subject to CEQA on sites one acre or greater, within 1,000 feet of residential and other sensitive land use projects (e.g., hospitals, schools, nursing homes, day care centers), as measured from the property line of the project to the property line of the source/edge of the sensitive land use, that utilize off-road equipment of 50 horsepower or more and, that occur for more than 12 months of active construction (i.e., exclusive of interior renovations), shall require preparation of a construction health risk assessment (HRA) prior to future discretionary project approval, as recommended in the current HRA Guidance Manual prepared by the California Office of Environmental Health Hazard Assessment (OEHHA). Additionally, UC Berkeley shall consider whether unusual circumstances warrant evaluation of construction health risks for projects with construction durations of less than 12 months or on development sites smaller than one acre. For example, unusual circumstances would include sites that require extensive site preparation with more

than 10,000 cubic yards of excavation. The construction HRA shall generally be prepared in accordance with policies and procedures of the OEHHA and the Bay Area Air Quality Management District. The latest OEHHA guidelines shall be used for the analysis, including age sensitivity factors, breathing rates, and body weights appropriate for children ages 0 to 16 years. If the construction HRA shows that the incremental cancer risk exceeds 10 in a million (10E-06), $PM_{2.5}$ concentrations exceed 0.3 $\mu g/m^3$, or the appropriate noncancer hazard index exceeds 1.0, the construction HRA shall be required to identify all feasible measures capable of reducing potential cancer and noncancer risks to an acceptable level to the extent feasible (i.e., below 10 in a million, a hazard index of 1.0, or 0.3 $\mu g/m^3$ of $PM_{2.5}$), including appropriate enforcement mechanisms. Examples of feasible measures include use of U.S. Environmental Protection Agency rated Tier 4 construction equipment, diesel particulate filters, and electric equipment.

The construction health risk assessment shall be submitted to UC Berkeley's Office of Environment, Health & Safety for review and approval. Measures identified in the health risk assessment shall be included in bid documents, purchase orders, contracts, and grading plans prepared for the development projects. Compliance with these measures shall be verified during regular construction site inspections

The Proposed Project would involve utility trenching, demolition and debris hauling, site preparation and soil haul, grading, and construction of an 81,700-SF academic building on a site greater than one acre in size and for a construction period over 12 months. Pursuant to Mitigation Measure AIR-3.1 of the Certified EIR, a health risk assessment (HRA) was conducted to determine potential health risk impacts from construction of the Proposed Project to nearby air quality sensitive receptors. The following provides the background methodology used for the construction HRA for the Proposed Project.

The latest version of the Bay Area Air Quality Management District (BAAQMD) CEQA Air Quality Guidelines requires projects to evaluate the impacts of construction activities on air quality sensitive receptors (BAAQMD, 2017). Project construction is anticipated to take place starting at the beginning of December 2023 and be completed by October 2026 (approximately 2.8 years or 728 workdays). As shown on Figure 1, the closest sensitive receptors to the Proposed Project are residential buildings approximately 530 feet north of the Proposed Project along Hearst Avenue. These receptor locations could be potentially impacted from the proposed construction activities. This HRA considers the health impact to off-site sensitive receptors (i.e., nearby residences) from construction emissions at the project site, including diesel equipment exhaust (diesel particulate matter or DPM) and particulate matter less than 2.5 microns ($PM_{2.5}$).

1.2 METHODOLOGY AND SIGNIFICANCE THRESHOLDS

For this HRA, the BAAQMD significance thresholds were deemed to be appropriate and the thresholds that were used for this project are shown below:

- Excess cancer risk of more than 10 in a million
- Non-cancer hazard index (chronic) greater than 1.0
- Incremental increase in average annual $PM_{2.5}$ concentration of greater than 0.3 micrograms per cubic meter ($\mu g/m^3$)

The methodology used in this HRA is consistent with the following BAAQMD and the Office of Environmental Health Hazard Assessment (OEHHA) guidance documents:

- BAAQMD, 2017. *California Environmental Quality Act (CEQA) Air Quality Guidelines*. May 2017.
- BAAQMD, 2016. *Planning Healthy Places*. May 2016.
- BAAQMD, 2012. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. Version 3.0. May 2012.
- OEHHA. 2015. *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Health Risk Assessments*. February, 2015.

Potential exposures to DPM and $PM_{2.5}$ from Proposed Project construction were evaluated for off-site sensitive receptors in close proximity to the site. Pollutant concentrations were estimated using an air dispersion model, and excess lifetime cancer risks and chronic non-cancer hazard indexes were calculated. These risks were then compared to the significance thresholds adopted for this HRA.

It should be noted that these health impacts are based on conservative (i.e., health protective) assumptions. The United States Environmental Protection Agency (USEPA, 2005) and OEHHA note that conservative assumptions used in a risk assessment are intended to ensure that the estimated risks do not underestimate the actual risks. The use of conservative assumptions tends to produce upper-bound estimates of exposure and thus may overestimate the actual risk.

For residential-based receptors, the following conservative assumptions were used:

- It was assumed that maximum-exposed off-site residential receptors (both children and adults) stood outdoors and are subject to DPM at their residence for 8 hours per day, and approximately 260 construction days per year. In reality, California residents typically will spend on average 2 hours per day outdoors at their residences (USEPA, 2011), so actual exposures and risks would be significantly lower than those calculated in this HRA.

- The calculated risk for infants from third trimester to age 2 is multiplied by a factor of 10 to account for early life exposure and uncertainty in child versus adult exposure impacts (OEHHA, 2015).

1.3 CONSTRUCTION EMISSIONS

Construction emissions were calculated as average daily emissions in pounds per day, using the proposed construction schedule and the latest version of California Emissions Estimation Model, known as CalEEMod Version 2022.1.1.5 (CAPCOA, 2023). DPM emissions were based on the CalEEMod construction runs, using annual exhaust PM_{10} construction emissions converted from tons per year to pounds (lbs) per day. The $PM_{2.5}$ emissions were taken from the CalEEMod output for combined exhaust $PM_{2.5}$ plus fugitive dust $PM_{2.5}$, also converted to lbs per day.

The Certified EIR identified significant and unavoidable impacts at the program level during construction of development under the LRDP Update. The following mitigation measure was included in the Certified EIR for construction activities associated with LRDP Update:

Mitigation Measure AIR-2.1: UC Berkeley shall use equipment that meets the United States Environmental Protection Agency Tier 4 Final emissions standards or higher for off-road diesel-powered construction equipment with more than 50 horsepower, unless it can be demonstrated to UC Berkeley that such equipment is not commercially available. For purposes of this mitigation measure, "commercially available" shall mean the availability of Tier 4 Final engines similar to the availability for other large-scale construction projects in the city occurring at the same time and taking into consideration factors such as (i) potential significant delays to critical-path timing of construction and (ii) geographic proximity to the project site of Tier 4 Final equipment. Where such equipment is not commercially available, as demonstrated by the construction contractor, Tier 4 interim equipment shall be used. Where Tier 4 interim equipment is not commercially available, as demonstrated by the contractor, Tier 3 equipment retrofitted with a California Air Resources Board's Level 3 Verified Diesel Emissions Control Strategy (VDECS) shall be used. The requirement to use Tier 4 Final equipment or higher for engines over 50 horsepower shall be identified in construction bids and the following shall also be completed:

- Prior to construction, the project engineer shall ensure that all demolition and grading plans clearly show the requirement for United States Environmental Protection Agency Tier 4 Final or higher emissions standards for construction equipment over 50 horsepower.
- During construction, the construction contractor shall maintain a list of all operating equipment in use over 20 hours on the construction site for verification by UC Berkeley.
- The construction equipment list shall state the makes, models, and numbers of construction equipment on-site.
- To the extent that equipment is available and cost-effective, contractors shall use electric, hybrid, or alternate-fueled off-road construction equipment.
- Contractors shall use electric construction tools, such as saws, drills, and compressors, where grid electricity is available.
- Construction activities shall be prohibited when the Air Quality Index (AQI), as measured by the closest Bay Area Quality Management District monitoring station (e.g., Berkeley Aquatic Center), is great than 150 for particulates and ozone in the project area.
- Contractors shall provide information on transit and ridesharing programs and services to construction employees. Additionally, meal options on-site and/or shuttles between the facility and nearby meal destinations for construction employees shall be provided.

Mitigation Measure AIR-2.1 of the Certified EIR is applicable to the Proposed Project and was included in the construction emissions modeling. Construction of the Proposed Project was assumed to take place over 2.8 years (728 workdays) beginning in December 2023 and to be completed by October 2026. The first phase of construction (Make Ready phase) would occur from December 2023 through August 2024 and includes utility trenching and building demolition of the bridge between the existing buildings. Asphalt demolition would occur from February 2024 to March 2024 and new building construction would occur between August 2024 to July 2026. New paving, painting, and finishing/landscaping would occur between January 2026 and October 2026. The average daily emission rates from construction equipment used during Proposed Project construction were determined by dividing the annual average emissions for each construction year by the number of construction

days per year for each calendar year of construction (i.e., 2023, 2024, 2025 and 2026). The CalEEMod construction emissions output and emission rate calculations are provided in Appendix A of the HRA.

1.4 DISPERSION MODELING

Air quality modeling was performed using the AERMOD atmospheric dispersion model to assess the impact of emitted compounds at nearby sensitive receptors. The model is a steady state Gaussian plume model and is an approved model by BAAQMD for estimating impacts from point and fugitive sources in simple and complex terrain. The on-site construction emissions for the project were modeled as poly-area sources. The off-site mobile sources were modeled as adjacent line volume sources. The model requires additional input parameters, including chemical emission data and local meteorology. Inputs for the construction emission rates are those described in Section 1.3. Meteorological data obtained from the California Air Resources Board (CARB) for the nearest representative meteorological station (Metro Oakland International Airport) with the five latest available years (2013 to 2017) of record were used to represent local weather conditions and prevailing winds (BAAQMD, 2023).

The modeling analysis also considered the spatial distribution and elevation of each emitting source in relation to the sensitive receptors. To accommodate the model's Cartesian grid format, direction-dependent calculations were obtained by identifying the Universal Transverse Mercator (UTM) coordinates for each source location. In addition, national elevation dataset (NED) data for the area were obtained and included in the model runs to account for complex terrain. An emission release height of 4.15 meters was used as representative of the stack exhaust height for off-road construction equipment and diesel truck traffic, and an initial vertical dispersion parameter of 1.93 m was used, per CARB guidance (CARB, 2000).

To determine contaminant impacts during construction hours, the model's Season-Hour-Day (HRDOW) scalar option was invoked to predict flagpole-level concentrations (1.5 m for ground-floor receptors and 6.1 m for 2nd-floor) for construction emissions generated between the hours of 7:00 AM and 4:00 PM with a 1-hour lunch break.

A unit emission rate of 1 gram per second was used for the air dispersion model to represent both DPM and $PM_{2.5}$ construction emissions. The unit emission rates were proportioned over the poly-area sources for on-site construction emissions and divided between the volume sources for off-site hauling emissions. The maximum modeled concentrations from the output files were then multiplied by the emission rates calculated in Appendix A to obtain the maximum flagpole-level concentrations at the off-site maximum exposed individual resident (MEIR). The MEIR is a multi-residential building at the northeast corner of Hearst Avenue and Highland Place.

The receptor locations are presented in Figure 1. The air dispersion model output is presented in Appendix B. The DPM and $PM_{2.5}$ concentrations at the MEIR are provided in Appendix C.

1.5 RISK CHARACTERIZATION

1.5.1 Carcinogenic Chemical Risk

A threshold of ten in a million ($10x10^{-6}$) has been established as a level posing no significant risk for exposures to carcinogens. Health risks associated with exposure to carcinogenic compounds can be defined in terms of

the probability of developing cancer as a result of exposure to a chemical at a given concentration. The cancer risk probability is determined by multiplying the chemical's annual concentration by its cancer potency factor (CPF), a measure of the carcinogenic potential of a chemical when a dose is received through the inhalation pathway. It is an upper-limit estimate of the probability of contracting cancer as a result of continuous exposure to an ambient concentration of one microgram per cubic meter ($\mu g/m^3$) over a lifetime of 70 years.

Recent guidance from OEHHA recommends a refinement to the standard point estimate approach with the use of age-specific breathing rates and age sensitivity factors (ASFs) to assess risk for susceptible subpopulations such as children. For the inhalation pathway, the procedure requires the incorporation of several discrete variates to effectively quantify dose for each age group. Once determined, contaminant dose is multiplied by the cancer potency factor in units of inverse dose expressed in milligrams per kilogram per day $(mg/kg/day)^{-1}$ to derive the cancer risk estimate. Therefore, to accommodate the unique exposures associated with the sensitive receptors, the following dose algorithm was used.

$$\text{Dose}_{\text{AIR,per age group}} = (C_{air} \times EF \times [\frac{BR}{BW}] \times A \times CF)$$

Where:

$Dose_{AIR}$	=	dose by inhalation (mg/kg-day), per age group
C_{air}	=	concentration of contaminant in air ($\mu g/m^3$)
EF	=	exposure frequency (number of days/365 days)
BR/BW	=	daily breathing rate normalized to body weight (L/kg-day)
A	=	inhalation absorption factor (default = 1)
CF	=	conversion factor ($1x10^{-6}$, µg to mg, L to m^3)

The inhalation absorption factor (A) is a unitless factor that is only used if the cancer potency factor included a correction for absorption across the lung. The default value of 1 was used for this assessment. For residential receptors, the exposure frequency (EF) of 0.96 is used to represent 350 days per year to allow for a two-week period away from home each year (OEHHA, 2015).

For construction analysis, the exposure duration spans the length of construction (e.g., 728 workdays). As the length of construction is more than 2 years, the third trimester, 0-2, and 2-9 age bins apply to the construction analysis for the off-site residential receptors. For residential receptors, the 95th percentile daily breathing rates (BR/BW), exposure duration (ED), age sensitivity factors (ASFs), and fraction of time at home (FAH) for the various age groups are provided herein:

Age Groups	BR/BW (L/kg-day)	ED	ASF	FAH
Third trimester	361	0.25	10	0.85
0-2 age group	1,090	2.0	10	0.85
2-9 age group	861	0.17	3	0.72

To calculate the overall cancer risk, the risk for each appropriate age group is calculated per the following equation:

$$\text{Cancer Risk}_{\text{AIR}} = \text{Dose}_{\text{AIR}} \times \text{CPF} \times \text{ASF} \times \text{FAH} \times \frac{\text{ED}}{AT}$$

Where:

Dose_{AIR}	=	dose by inhalation (mg/kg-day), per age group
CPF	=	cancer potency factor, chemical-specific $(\text{mg/kg-day})^{-1}$
ASF	=	age sensitivity factor, per age group
FAH	=	fraction of time at home, per age group (for residential receptors only)
ED	=	exposure duration (years)
AT	=	averaging time period over which exposure duration is averaged (70 years)

The CPFs used in the assessment were obtained from OEHHA guidance. The excess lifetime cancer risks during the construction period to the maximally exposed resident and students were calculated based on the factors provided above. The cancer risks for each age group are summed to estimate the total cancer risk for each toxic chemical species. The final step converts the cancer risk in scientific notation to a whole number that expresses the cancer risk in "chances per million" by multiplying the cancer risk by a factor of $1x10^6$ (i.e., 1 million).

The calculated results are provided in Appendix C.

1.5.2 Non-Carcinogenic Hazards

An evaluation was also conducted of the potential non-cancer effects of chronic chemical exposures. Adverse health effects are evaluated by comparing the annual receptor level (flagpole) concentration of each chemical compound with the appropriate reference exposure limit (REL). Available RELs promulgated by OEHHA were considered in the assessment.

The hazard index approach was used to quantify non-carcinogenic impacts. The hazard index assumes that chronic sub-threshold exposures adversely affect a specific organ or organ system (toxicological endpoint). Target organs presented in regulatory guidance were used for each discrete chemical exposure. To calculate the hazard index, each chemical concentration or dose is divided by the appropriate toxicity value. This ratio is summed for compounds affecting the same toxicological endpoint. A health hazard is presumed to exist where the total equals or exceeds one.

The chronic hazard analysis for DPM is provided in Appendix C. The calculations contain the relevant exposure concentrations and corresponding reference dose values used in the evaluation of non-carcinogenic exposures.

1.5.3 Criteria Pollutants

The BAAQMD incorporated $PM_{2.5}$ into the District's CEQA significance thresholds due to recent studies that show adverse health impacts from exposure to this pollutant. An incremental increase of greater than 0.3 $\mu g/m^3$ for the annual average $PM_{2.5}$ concentration is considered to be a significant impact.

1.6 CONSTRUCTION HRA RESULTS

The calculated results are provided in Appendix C of this HRA and the results are summarized in Table 1.

TABLE 1. CONSTRUCTION RISK SUMMARY

Receptor	Cancer Risk (per million)	Chronic Hazards	$PM_{2.5}$ ($\mu g/m^3$)
Maximum Exposed Individual Resident (MEIR)	0.5	0.001	0.015
BAAQMD Threshold	10	1.0	0.30
Exceeds Threshold?	**No**	**No**	**No**

Note: Modeling includes Mitigation Measure AIR-2.1 of the Certified EIR, which requires use of Tier 4 Final equipment for engines 50 horsepower and higher.

Cancer risk for the MEIR from project-related construction emissions was calculated to be 0.5 in a million, which is below the significance threshold of 10 in a million. In accordance with the latest 2015 OEHHA guidance, the calculated total cancer risk conservatively assumes that the risk for the MEIR consists of a pregnant woman in the third trimester that subsequently gives birth to an infant during the approximately 2.8-year construction period; therefore, calculated risk values for the first 2.25 years were multiplied by a factor of 10 and the remaining risk values by a factor of 3. In addition, it was conservatively assumed that the residents were outdoors 8 hours a day and exposed to all of the daily construction emissions.

For non-carcinogenic effects, the chronic hazard index identified for each toxicological endpoint totaled less than 1.0 for all off-site sensitive receptors. Therefore, chronic non-carcinogenic hazards are less than significant. Additionally, the maximum annual $PM_{2.5}$ concentrations would not exceed the BAAQMD significance threshold of 0.3 micrograms per cubic meter ($\mu g/m^3$) for all off-site sensitive receptors.

As noted in Section 1.3 of this HRA, Mitigation Measure AIR-2.1 of the Certified EIR was included in the construction modeling used to determine the health risks provided in Table 1. The results indicate that, with Mitigation Measure AIR-2.1 of the Certified EIR, excess cancer risk would be below the BAAQMD's significance thresholds for the MEIR. The project would not expose off-site sensitive receptors to substantial concentrations of air pollutant emissions during construction and impacts would be less than significant with mitigation. Therefore, the Proposed Project would not result in any new significant impacts, and no new mitigation measures are required.

2. References

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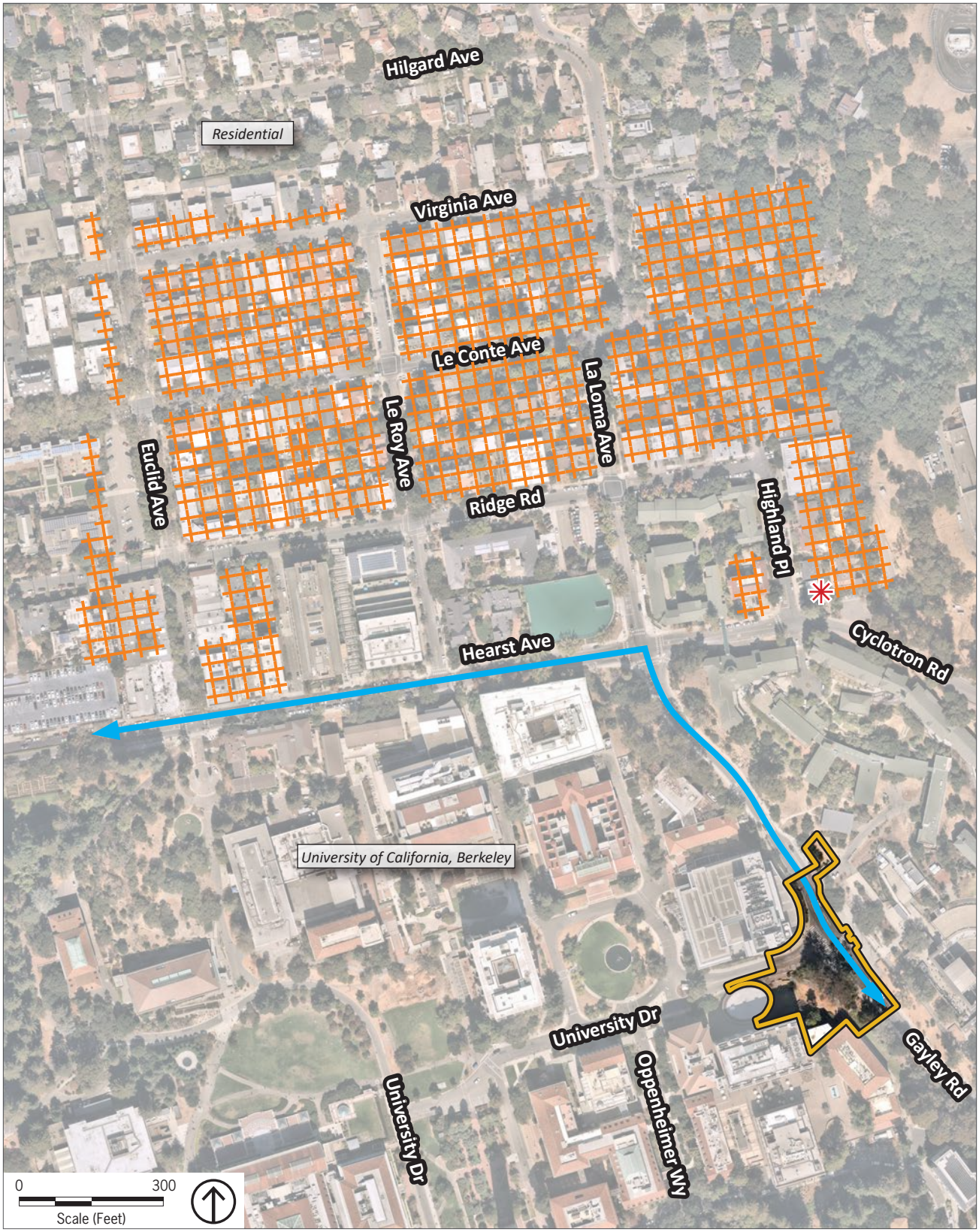


Source: Nearmap, 2023, (Imagery date: 9/16/2022).

Project Site | Maximum Exposed Individual Resident (MEIR) | Receptors | Truck Route

Figure 1
Project Site and Off-site Receptor Locations

Appendix A. Emission Rate Calculations

Average Daily Emission Rates: Mitigation Measure AIR-2.1 from LRDP

On-site Exhaust Emissions[1]	DPM				PM2.5				Construction Duration per Year		
Year	Annual PM10 Exhaust Emissions (lbs/yr)	Average Daily Emissions (lbs/day)	Average Emission Rate (lbs/hr)	Average Emission Rate (g/s)	Annual PM2.5 Total Emissions (lbs/yr)	Average Daily Emissions (lbs/day)	Average Emission Rate (lbs/hr)	Average Emission Rate (g/s)	Planned Work Days day/yr	Total Work Days days/yr	Scalar[2]
2023	2.34	0.21	2.66E-02	3.35E-03	16.46	1.50	1.87E-01	2.36E-02	11	260	0.04
2024	47.69	0.18	2.28E-02	2.87E-03	240.05	0.92	1.15E-01	1.44E-02	262	262	1.00
2025	44.94	0.17	2.15E-02	2.71E-03	41.69	0.16	2.00E-02	2.52E-03	261	261	1.00
2026	35.98	0.19	2.32E-02	2.92E-03	33.49	0.17	2.16E-02	2.72E-03	194	261	0.74

Hauling Exhaust Emissions[1]	DPM					PM2.5				
Year	Annual PM10 Exhaust Emissions (lbs/yr)	Hauling Emissions w/in 1,000 ft (lbs/yr)	Average Daily Emissions (lbs/day)	Average Emission Rate (lbs/hr)	Average Emission Rate (g/s)	Annual PM2.5 Total Emissions (lbs/yr)	Hauling Emissions w/in 1,000 ft (lbs/yr)	Average Daily Emissions (lbs/day)	Average Emission Rate (lbs/hr)	Average Emission Rate (g/s)
2023	0.1250	2.54E-03	2.31E-04	2.89E-05	3.64E-06	1.1140	2.27E-02	2.06E-03	2.58E-04	3.25E-05
2024	4.7740	9.71E-02	3.71E-04	4.63E-05	5.84E-06	37.2970	7.59E-01	2.90E-03	3.62E-04	4.56E-05
2025	1.2930	2.63E-02	1.01E-04	1.26E-05	1.59E-06	24.7530	5.04E-01	1.93E-03	2.41E-04	3.04E-05
2026	0.7010	1.43E-02	7.35E-05	9.19E-06	1.16E-06	19.5180	3.97E-01	2.05E-03	2.56E-04	3.22E-05

Note: Emissions evenly distributed over 65 modeled volume sources.

Hauling Length (miles) [3]	20.0	Weighted Average (mi)
Haul Length within 1,000 ft of Site (mile) [4]	0.41	mi
Hours per work day (7:00 AM to 4:00 PM, 1-hour of breaks) [5]	8	hours

[1] DPM emissions taken as PM_{10} exhaust emissions (CalEEMod average annual emissions).

[2] Construction duration scalars determined for each year of construction to adjust receptor exposures to the exposure durations for each modeled construction year (used in risk calculation in App C).

[3] Weighted Average haul length for demolition and soil haul.

[4] Emissions from CalEEMod offsite average annual emissions, which is based on total haul truck trip distances, are adjusted to evaluate local emissions from the 0.41 -mile route within 1,000 of the project site.

[5] Work hours applied in By Hour/Day (HRDOW) variable emissions module in air dispersion model (see App B - Air Dispersion Model Output Files).

Annual Construction Emissions: Construction Calculations - Annual - Pounds

Make Ready Work

		PM10 Exhaust	PM2.5 Ex	PM2.5 Dust	PM2.5 Total
Onsite	**2023**				
Off-Road		1.87056	1.721		1.721
Dust from MatMov					0.000
Demolition				0.034	0.034
Total		**1.87056**			**1.755**
Offsite					
Mobile Exhaust		0.066	0.066	0.091	0.157
On-Road Fug Dust				0.468	0.468
Total		**0.066**			**0.625**
Onsite	**2024**				
Off-Road		21.81	20.07		20.070
Dust from MatMov					0.000
Demolition				0.439	0.439
Total		**21.81**			**20.509**
Offsite					
Mobile Exhaust		0.864	0.864	1.191	2.055
On-Road Fug Dust				6.108	6.108
Total		**0.864**			**8.163**

Site Prep

		PM10 Exhaust	PM2.5 Ex	PM2.5 Dust	PM2.5 Total
Onsite	**2023**				
Off-Road		0.472	0.472		0.472
Dust from MatMov				14.23	14.230
Demolition					0.000
Total		**0.472**			**14.702**
Offsite					
Mobile Exhaust		0.059	0.059	0.083	0.142
On-Road Fug Dust				0.347	0.347
Total		**0.059**			**0.489**
Onsite	**2024**				
Off-Road		2.053	2.053		2.053
Dust from MatMov				61.92	61.920
Demolition					0.000
Total		**2.053**			**63.973**
Offsite					
Mobile Exhaust		0.257	0.257	0.363	0.620
On-Road Fug Dust				1.512	1.512
Total		**0.257**			**2.132**

Asphalt Demo

		PM10 Exhaust	PM2.5 Ex	PM2.5 Dust	PM2.5 Total
Onsite	**2024**				
Off-Road		0.774	0.774		0.774
Dust from MatMov					0.000
Demolition				4.821	4.821
Total		**0.774**			**5.595**
Offsite					
Mobile Exhaust		0.423	0.423	0.575	0.998
On-Road Fug Dust				1.399	1.399
Total		**0.423**			**2.397**

Grading

		PM10 Exhaust	PM2.5 Ex	PM2.5 Dust	PM2.5 Total
Onsite	**2024**				
Off-Road		4.061	4.061		4.061
Dust from MatMov				128.3	128.3
Demolition					0
Total		**4.061**			**132.361**
Offsite					
Mobile Exhaust		2.741	2.741	3.702	6.443
On-Road Fug Dust				8.804	8.804
Total		**2.741**			**15.247**

Building Construction

		PM10 Exhaust	PM2.5 Ex	PM2.5 Dust	PM2.5 Total
Onsite	**2024**				
Off-Road		18.99	17.61		
Total		**18.99**			**17.61**
Offsite					
Mobile Exhaust		0.489	0.489	0.733	1.222
On-Road Fug Dust				8.136	8.136
Total		**0.489**			**9.358**
Onsite	**2025**				
Off-Road		44.94	41.69		
Total		**44.94**			**41.69**
Offsite					
Mobile Exhaust		1.293	1.293	1.94	3.233
On-Road Fug Dust				21.52	21.52
Total		**1.293**			**24.753**
Onsite	**2026**				
Off-Road		21.64	20.09		
Total		**21.64**			**20.09**
Offsite					
Mobile Exhaust		0.701	0.701	1.052	1.753
On-Road Fug Dust				11.67	11.67
Total		**0.701**			**13.423**

Architectural Coatings

		PM10 Exhaust	PM2.5 Ex	PM2.5 Dust	PM2.5 Total
Onsite	**2026**				
Off-Road		3.496	3.216		
Total		**3.496**			**3.216**
Offsite					
Mobile Exhaust		0	0	0	0
On-Road Fug Dust				1.947	1.947
Total		**0**			**1.947**

Landscaping

		PM10 Exhaust	PM2.5 Ex	PM2.5 Dust	PM2.5 Total
Onsite	**2026**				
Off-Road		1.747	1.627		
Total		**1.747**			**1.627**
Offsite					
Mobile Exhaust		0	0	0	0
On-Road Fug Dust				0.601	0.601
Total		**0**			**0.601**

Paving

		PM10 Exhaust	PM2.5 Ex	PM2.5 Dust	PM2.5 Total
Onsite	**2026**				
Off-Road		9.093	8.554		
Total		**9.093**			**8.554**
Offsite					
Mobile Exhaust		0	0	0	0
On-Road Fug Dust				3.547	3.547
Total		**0**			**3.547**

CalEEMod Inputs- Chemistry Building, Construction

Name: New Chemistry Building Project, Construction
Project Number: UCB-01.3
Project Location: University of California University Dr Berkeley, CA 94720
County: Alameda
CEC California Electricity Demand Forecast Zone: 1
Land Use Setting: Urban
Electric Utility Company: Pacific Gas & Electric Company (PG&E)
Gas Utility Company: Pacific Gas & Electric Company (PG&E)
Air Basin: San Francisco Bay Area Air Basin (SFBAAB)
Air District: Bay Area Air Quality Management District (BAAQMD)

Project Site Acreage	1.41
Disturbed Site Acreage	1.28

Project Components	SQFT	Tons			
Asphalt Demolition	-	2,200			
Building Demolition	4700	216			
Construction	**SQFT**	**Building Footprint**	**Acres**		
Chemistry Building					
Unassigned Space	24,000	-	-		
Laboratory	31,100	-	-		
Non-Lab Workspace	14,900	-	-		
Flex Space	3,300	-	-		
TOTAL[1]	**81,700**	**12,700**	0.29		
Onsite Surface Work	**SQFT**	**Building Footprint**	**Acres**	**Stalls**	
Parking Lot	15,000	-	0.34	600	
Landscaping	14,000	-	0.32		
Hardscape	14,000	-	0.32		
		TOTAL ACREAGE	**1.28**		

CalEEMod Land Use Inputs

Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage	Building Square Feet	Landscape Area Square Feet	Special Landscape Area Square Feet
Educational	University/College (4yr)	81.70	1000 sqft	0.61	81,700	14,000	0
Parking	Parking Lot	15.00	1000 sqft	0.34	15,000	0	0
Parking	Other Non-Asphalt Surfaces	14.00	1000 sqft	0.32	14,000	0	0
				1.28			

Demolition

Component	Amount to be Demolished	Haul Truck Capacity (Tons or CY per truck)[1]	Haul Distance (miles)[1]	Total Trip Ends	Duration (days)	Trip Ends/Day
Asphalt Demolition Debris Haul (Tons)	2200	16	20	276	21	13
Building Demolition Debris Haul (CY)	432	16	20	56	22	3
Total	2,632			332		16

Notes:
[1] Applicant provided 16 tons/truck haul capacity for asphalt demo. CalEEMod default 16 CY/truck used for building debris haul.

Soil Haul [1]

Construction Activities	Volume (CY)[1]	Haul Truck Capacity (CY)[2]	Haul Distance (miles)[2]	Total Trip Ends	Duration (days)	Trip Ends/Day
Site Preparation soil haul (import)	250	16	20	32	65	1
Rough Grading soil haul (import)	1,550	16	20	194	96	2
Site Preparation soil haul (export)	100	16	20	14	65	1
Rough Grading soil haul (export)	13,300	16	20	1664	96	17

Notes:

[1] Conservative estimate of 1 trip ends/day for site preparation soil haul phase.

Architectural Coating

	Percent Painted
Interior Painted:	100%
Exterior Painted:	0%

BAAQMD Rule 1113

Interior Paint VOC content:	100	grams per liter
Exterior Paing VOC content:	-	grams per liter

Structures	Land Use Square Feet	CalEEMod Factor[2]	Total Paintable Surface Area	Paintable Interior Area[1]	Paintable Exterior Area[1]
Non-Residential Structures					
University/College (4yr)	81,700	2.0	163,400	122,550	0
			163,400	**122,550**	**0**
Parking					
Parking Lot	15,000			-	1,740
					1,740

Notes

[1] CalEEMod methodology calculates the paintable interior and exterior areas by multiplying the total paintable surface area by 75 and 25 percent, respectively.

[2] The program assumes the total surface for painting equals 2 times the floor square footage for nonresidential square footage defined by the user.

[3] CalEEmod default used for striping of parking lot.

CalEEMod Construction Measures

C-10-A	Water Exposed Surfaces	Frequency per day:	2	
		PM10:	55	% Reduction
		PM2.5:	55	% Reduction
C-11	Limit Vehicle Speeds on Unpaved Roads	Miles per hour speed limit:	25	
		PM10:	44	% Reduction
		PM25:	44	% Reduction
C-12	Sweep Paved Roads	PM10:	9	% Reduction
		PM25:	9	% Reduction

Building Demolition Haul Trip Calculation

Source: CalEEMod User's Guide Version 2022.1, Appendix C

Conversion factors

0.046	ton/SF	Building Debris
2	CY/ton	Building Debris
1.2641662	tons/CY	Soil
20	tons	Truck Capacity in tons
10	CY	Truck Capacity in CY
0.5	CY/ton	Soil

Building	BSF Demo[1]	Tons/SF	Tons	CY of Building Materials	Haul Truck (CY)	Haul Truck (Ton)[2]	Round Trips	Total Trip Ends
Building Demo (bridge)	4,700	0.046	216.2	432.4	16	20	28	56

Notes:

[1] BSF provided by Applicant.

[2] CalEEMod default haul truck capacity used.

Construction Activities and Schedule Assumptions

		Construction Schedule		
Construction Activities	**Phase Type**	**Start Date**	**End Date**	**CalEEMod Duration (Workday)**
Make Ready	Trenching	12/15/2023	8/9/2024	171
Building (Bridge) Demo Haul		12/15/2023	1/15/2024	22
Site Preparation	Site Preparation	12/15/2023	3/14/2024	65
Site Prep Soil Haul		12/15/2023	3/14/2024	65
Asphalt Demolition	Demolition	2/16/2024	3/15/2024	21
Asphalt Demolition Debris Haul		2/23/2024	3/22/2024	21
Rough Grading	Grading	3/22/2024	8/2/2024	96
Rough Grading Soil Haul		3/29/2024	8/9/2024	96
Building Construction	Building Construction	8/16/2024	7/17/2026	501
Paving	Paving	1/16/2026	8/16/2026	151
Architectural Coating	Architectural Coating	1/16/2026	8/16/2026	151
Finishing/Landscaping	Trenching	8/16/2026	9/29/2026	32

Overlapping Construction Schedule (CalEEMod)

Construction Activities	**Start Date**	**End Date**	**CalEEMod Duration (Workday)**
Make Ready and Site Preparation	12/15/2023	2/15/2024	45
Make Ready, Site Preparation, and Asphalt Demolition	2/16/2024	3/14/2024	20
Make Ready and Asphalt Demolition	3/15/2024	3/15/2024	1
Make Ready	3/16/2024	3/21/2024	4
Make Ready and Rough Grading	3/22/2024	8/2/2024	96
Make Ready	8/3/2024	8/9/2024	5
Building Construction	8/16/2024	1/15/2026	370
Building Construction, Paving, and Architectural Coating	1/16/2026	7/17/2026	131
Paving and Architectural Coating	7/18/2026	8/15/2026	20
Paving, Architectural Coating, and Fnishing/Landscaping	8/16/2026	8/16/2026	0
Finishing/Landscaping	8/17/2026	9/29/2026	32

Notes:

[1] Assumed Underpinning phase to overlap with Rough Grading phase; Utility Trenching phase overlap with Make Ready phase; Fine grading phase overlap with finishing/landscaping phase.

CalEEMod Construction Off-Road Equipment Inputs

Water Truck Vendor Trip Calculation

Amount of Water (gal/acre/day)[1]	Water Truck Capacity (gallons)[2]
10,000	4,000

Notes:

[1] *Based on data provided in Guidance for Application for Dust Control Permit*

Maricopa County Air Quality Department. 2005, June. Guidance for Application of Dust Control Permit. https://www.epa.gov/sites/default/files/2019-04/documents/mr_guidanceforapplicationfordustcontrolpermit.pdf)

[2] *Based on standard water truck capacity:*
McLellan Industries. 2022, January (access). Water Trucks. https://www.mclellanindustries.com/trucks/w

[3] *Assumes that dozers, tractors/loaders/backhoes, and graders can disturb 0.50 acres per day and scrapers can disturb 1 acre per day.*

Construction Equipment Details			
CalEEMod Equipment[2]	**# of Equipment**	**hr/day**	**total trips per day**
Make Ready[1]			
Concrete/Industrial Saws	1	6	
Excavators	2	8	
Generator Sets	1	8	
Plate Compactors	1	8	
Worker Trips			13
Vendor Trips			4
Hauling Trips			3
Water Trucks	Acres Disturbed:	0	0
Asphalt Demolition			
Rubber Tired Dozers	1	8	
Tractors/Loaders/Backhoes	2	8	
Worker Trips			8
Vendor Trips			0
Hauling Trips			13
Water Trucks	Acres Disturbed:	1.5	8
Site Preparation			
Graders	1	8	
Rubber Tired Dozers	1	7	
Tractors/Loaders/Backhoes	1	8	
Worker Trips			8
Vendor Trips			0
Hauling Trips			2
Water Trucks	Acres Disturbed:	1	6
Rough Grading			
Graders	1	8	
Rubber Tired Dozers	1	8	
Tractors/Loaders/Backhoes	1	7	
Bore/Drill Rig[3]	1	1	
Worker Trips			10
Vendor Trips			0
Hauling Trips			19
Water Trucks	Acres Disturbed:	1.5	8

Building Construction				
	Cranes	1	4	
	Forklift	1	6	
	Generator Sets	1	8	
	Tractors/Loaders/Backhoes	1	6	
	Welders	3	8	
	Bore/Drill Rig[3]	1	1	
	Worker Trips			34
	Vendor Trips			13
	Hauling Trips			0
Paving				
	Cement and Mortar Mixers	1	6	
	Pavers	1	6	
	Paving Equipment	1	8	
	Rollers	1	7	
	Tractors/Loaders/Backhoes	1	8	
	Worker Trips			13
	Vendor Trips			0
	Hauling Trips			0
Architectural Coating				
	Air Compressors	1	6	
	Worker Trips			7
	Vendor Trips			0
	Hauling Trips			0
Finishing/Landscaping[1]				
	Forklift	1	6	
	Plate Compactors	1	8	
	Rollers	1	8	
	Tractors/Loaders/Backhoes	1	8	
	Worker Trips			10
	Vendor Trips			0
	Hauling Trips			0

Notes:

[1] Equipment used from past similar development project.

[2] Use of Tier 4 Final equipment for equipment above 50 hp as required by Mitigation Measure AIR-2.1.

[3] Bore/Drill rig included as provided by Applicant.

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	UCB-01.3
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.90
Precipitation (days)	44.2
Location	37.87352316657015, -122.25556127098729
County	Alameda
City	Berkeley
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1585
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
University/College (4yr)	81.7	Student	0.61	81,700	14,000	0.00	—	—
Parking Lot	15.0	1000sqft	0.34	0.00	0.00	—	—	—

Other Non-Asphalt Surfaces	14.0	1000sqft	0.32	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.43	5.04	8.00	20.7	0.04	0.24	3.47	3.68	0.22	1.52	1.72	—	4,971	4,971	0.22	0.33	5.23	5,080
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.43	5.03	8.29	28.7	0.06	0.24	4.67	4.91	0.23	1.58	1.82	—	6,626	6,626	0.28	0.33	0.14	6,729
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.72	2.08	4.69	11.4	0.02	0.14	1.52	1.67	0.14	0.62	0.76	—	2,622	2,622	0.11	0.14	1.08	2,667
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.13	0.38	0.86	2.09	< 0.005	0.03	0.28	0.30	0.02	0.11	0.14	—	434	434	0.02	0.02	0.18	442

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.07	0.90	7.45	18.9	0.04	0.21	3.47	3.68	0.20	1.52	1.72	—	4,971	4,971	0.22	0.33	5.23	5,080
2025	1.01	0.85	5.76	12.1	0.02	0.18	0.38	0.56	0.16	0.09	0.26	—	2,255	2,255	0.08	0.08	2.14	2,282
2026	1.43	5.04	8.00	20.7	0.03	0.24	0.54	0.78	0.22	0.13	0.36	—	3,533	3,533	0.13	0.09	2.60	3,566
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.94	0.80	5.95	17.2	0.03	0.20	2.79	2.99	0.19	1.26	1.45	—	3,472	3,472	0.14	0.13	0.06	3,513
2024	1.19	1.00	8.29	28.7	0.06	0.24	4.67	4.91	0.23	1.58	1.82	—	6,626	6,626	0.28	0.33	0.14	6,729
2025	1.00	0.85	5.82	11.9	0.02	0.18	0.38	0.56	0.16	0.09	0.26	—	2,234	2,234	0.09	0.08	0.06	2,259
2026	1.43	5.03	8.06	20.5	0.03	0.24	0.54	0.78	0.22	0.13	0.36	—	3,500	3,500	0.14	0.09	0.07	3,531
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.03	0.03	0.20	0.57	< 0.005	0.01	0.09	0.10	0.01	0.04	0.05	—	116	116	< 0.005	< 0.005	0.03	117
2024	0.72	0.59	4.69	11.4	0.02	0.14	1.52	1.67	0.14	0.62	0.76	—	2,622	2,622	0.11	0.14	1.08	2,667
2025	0.72	0.61	4.14	8.50	0.01	0.13	0.26	0.39	0.12	0.06	0.18	—	1,597	1,597	0.06	0.05	0.66	1,615
2026	0.59	2.08	3.29	8.51	0.01	0.10	0.21	0.31	0.09	0.05	0.15	—	1,449	1,449	0.06	0.04	0.45	1,461
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.01	< 0.005	0.04	0.10	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	19.1	19.1	< 0.005	< 0.005	0.01	19.4
2024	0.13	0.11	0.86	2.09	< 0.005	0.03	0.28	0.30	0.02	0.11	0.14	—	434	434	0.02	0.02	0.18	442
2025	0.13	0.11	0.76	1.55	< 0.005	0.02	0.05	0.07	0.02	0.01	0.03	—	264	264	0.01	0.01	0.11	267
2026	0.11	0.38	0.60	1.55	< 0.005	0.02	0.04	0.06	0.02	0.01	0.03	—	240	240	0.01	0.01	0.08	242

3. Construction Emissions Details

3.1. Demolition (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	0.18	0.96	10.8	0.02	0.04	—	0.04	0.04	—	0.04	—	1,959	1,959	0.08	0.02	—	1,966
Demolition	—	—	—	—	—	—	1.52	1.52	—	0.23	0.23	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.06	0.62	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	113	113	< 0.005	< 0.005	—	113
Demolition	—	—	—	—	—	—	0.09	0.09	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	18.7	18.7	< 0.005	< 0.005	—	18.7
Demolition	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.27	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	61.4	61.4	< 0.005	< 0.005	0.01	62.3
Vendor	0.02	0.01	0.29	0.12	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	217	217	0.01	0.03	0.01	227
Hauling	0.07	0.02	1.20	0.46	0.01	0.02	0.24	0.26	0.02	0.07	0.08	—	929	929	0.05	0.15	0.05	974
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.56	3.56	< 0.005	< 0.005	0.01	3.61
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.5	12.5	< 0.005	< 0.005	0.01	13.0
Hauling	< 0.005	< 0.005	0.07	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	53.4	53.4	< 0.005	0.01	0.05	56.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.59	0.59	< 0.005	< 0.005	< 0.005	0.60
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.06	2.06	< 0.005	< 0.005	< 0.005	2.16
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	8.84	8.84	< 0.005	< 0.005	0.01	9.28

3.3. Site Preparation (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.19	0.19	1.01	11.9	0.02	0.04	—	0.04	0.04	—	0.04	—	2,063	2,063	0.08	0.02	—	2,070

Dust From Material Movement	—	—	—	—	—	—	2.44	2.44	—	1.17	1.17	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.03	0.40	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	68.6	68.6	< 0.005	< 0.005	—	68.9
Dust From Material Movement	—	—	—	—	—	—	0.08	0.08	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.4	11.4	< 0.005	< 0.005	—	11.4
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.30	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	62.6	62.6	< 0.005	< 0.005	0.01	63.4
Vendor	0.01	0.01	0.22	0.10	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	165	165	0.01	0.02	0.01	172
Hauling	0.01	< 0.005	0.19	0.07	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	145	145	0.01	0.02	0.01	152

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.10	2.10	< 0.005	< 0.005	< 0.005	2.13
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	5.47	5.47	< 0.005	< 0.005	0.01	5.72
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.82	4.82	< 0.005	< 0.005	< 0.005	5.06
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.35	0.35	< 0.005	< 0.005	< 0.005	0.35
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.91	0.91	< 0.005	< 0.005	< 0.005	0.95
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.80	0.80	< 0.005	< 0.005	< 0.005	0.84

3.5. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.19	0.19	1.01	11.9	0.02	0.04	—	0.04	0.04	—	0.04	—	2,064	2,064	0.08	0.02	—	2,071
Dust From Material Movement	—	—	—	—	—	—	2.44	2.44	—	1.17	1.17	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.15	1.72	< 0.005	0.01	—	0.01	0.01	—	0.01	—	299	299	0.01	< 0.005	—	300

Dust From Material Movement	—	—	—	—	—	—	0.35	0.35	—	0.17	0.17	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.03	0.31	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	49.5	49.5	< 0.005	< 0.005	—	49.6
Dust From Material Movement	—	—	—	—	—	—	0.06	0.06	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.27	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	61.4	61.4	< 0.005	< 0.005	0.01	62.3
Vendor	0.01	< 0.005	0.21	0.09	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	162	162	0.01	0.02	0.01	170
Hauling	0.01	< 0.005	0.18	0.07	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	143	143	0.01	0.02	0.01	150
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.96	8.96	< 0.005	< 0.005	0.02	9.09
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	23.5	23.5	< 0.005	< 0.005	0.03	24.6
Hauling	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	20.7	20.7	< 0.005	< 0.005	0.02	21.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.48	1.48	< 0.005	< 0.005	< 0.005	1.51
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.89	3.89	< 0.005	< 0.005	< 0.005	4.08

Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.42	3.42	< 0.005	< 0.005	< 0.005	3.59

3.7. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.21	1.10	12.8	0.02	0.04	—	0.04	0.04	—	0.04	—	2,247	2,247	0.09	0.02	—	2,255
Dust From Material Movement	—	—	—	—	—	—	2.77	2.77	—	1.34	1.34	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.21	1.10	12.8	0.02	0.04	—	0.04	0.04	—	0.04	—	2,247	2,247	0.09	0.02	—	2,255
Dust From Material Movement	—	—	—	—	—	—	2.77	2.77	—	1.34	1.34	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.06	0.29	3.37	0.01	0.01	—	0.01	0.01	—	0.01	—	591	591	0.02	< 0.005	—	593

Dust From Material Movement	—	—	—	—	—	—	0.73	0.73	—	0.35	0.35	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.61	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	97.9	97.9	< 0.005	< 0.005	—	98.2
Dust From Material Movement	—	—	—	—	—	—	0.13	0.13	—	0.06	0.06	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.02	0.41	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	88.3	88.3	< 0.005	< 0.005	0.38	89.7
Vendor	0.02	0.01	0.27	0.12	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	216	216	0.01	0.03	0.58	227
Hauling	0.10	0.03	1.69	0.67	0.01	0.03	0.36	0.38	0.03	0.10	0.12	—	1,381	1,381	0.07	0.22	3.05	1,451
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.03	0.37	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	81.9	81.9	< 0.005	< 0.005	0.01	83.0
Vendor	0.02	0.01	0.29	0.12	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	217	217	0.01	0.03	0.01	227
Hauling	0.10	0.03	1.78	0.68	0.01	0.03	0.36	0.38	0.03	0.10	0.12	—	1,382	1,382	0.07	0.22	0.08	1,449
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	21.7	21.7	< 0.005	< 0.005	0.04	22.0
Vendor	< 0.005	< 0.005	0.07	0.03	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	< 0.005	—	57.0	57.0	< 0.005	0.01	0.07	59.6
Hauling	0.03	0.01	0.46	0.18	< 0.005	0.01	0.09	0.10	0.01	0.03	0.03	—	363	363	0.02	0.06	0.35	381

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.59	3.59	< 0.005	< 0.005	0.01	3.65
Vendor	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.43	9.43	< 0.005	< 0.005	0.01	9.87
Hauling	< 0.005	< 0.005	0.08	0.03	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	60.1	60.1	< 0.005	0.01	0.06	63.1

3.9. Building Construction (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	0.77	5.37	10.6	0.02	0.19	—	0.19	0.18	—	0.18	—	1,601	1,601	0.06	0.01	—	1,607
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	0.77	5.37	10.6	0.02	0.19	—	0.19	0.18	—	0.18	—	1,601	1,601	0.06	0.01	—	1,607
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.25	0.21	1.45	2.87	< 0.005	0.05	—	0.05	0.05	—	0.05	—	432	432	0.02	< 0.005	—	434
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.04	0.26	0.52	< 0.005	0.01	—	0.01	0.01	—	0.01	—	71.6	71.6	< 0.005	< 0.005	—	71.8

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.12	0.08	1.42	0.00	0.00	0.28	0.28	0.00	0.07	0.07	—	303	303	0.01	0.01	1.29	308
Vendor	0.03	0.01	0.46	0.20	< 0.005	< 0.005	0.09	0.10	< 0.005	0.03	0.03	—	362	362	0.01	0.05	0.96	380
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.12	0.11	1.25	0.00	0.00	0.28	0.28	0.00	0.07	0.07	—	281	281	0.01	0.01	0.03	285
Vendor	0.03	0.01	0.48	0.21	< 0.005	< 0.005	0.09	0.10	< 0.005	0.03	0.03	—	363	363	0.01	0.05	0.02	379
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.33	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	76.4	76.4	< 0.005	< 0.005	0.15	77.6
Vendor	0.01	< 0.005	0.13	0.05	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	97.9	97.9	< 0.005	0.01	0.11	102
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.7	12.7	< 0.005	< 0.005	0.02	12.8
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	16.2	16.2	< 0.005	< 0.005	0.02	17.0
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.86	0.73	5.25	10.6	0.02	0.17	—	0.17	0.16	—	0.16	—	1,601	1,601	0.06	0.01	—	1,607
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.86	0.73	5.25	10.6	0.02	0.17	—	0.17	0.16	—	0.16	—	1,601	1,601	0.06	0.01	—	1,607
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.62	0.52	3.75	7.56	0.01	0.12	—	0.12	0.11	—	0.11	—	1,144	1,144	0.05	0.01	—	1,148
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.09	0.68	1.38	< 0.005	0.02	—	0.02	0.02	—	0.02	—	189	189	0.01	< 0.005	—	190
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.12	0.08	1.32	0.00	0.00	0.28	0.28	0.00	0.07	0.07	—	297	297	0.01	0.01	1.18	302
Vendor	0.03	0.01	0.44	0.19	< 0.005	< 0.005	0.09	0.10	< 0.005	0.03	0.03	—	357	357	0.01	0.05	0.96	373
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.11	0.11	1.17	0.00	0.00	0.28	0.28	0.00	0.07	0.07	—	276	276	0.01	0.01	0.03	279
Vendor	0.03	0.01	0.46	0.20	< 0.005	< 0.005	0.09	0.10	< 0.005	0.03	0.03	—	357	357	0.01	0.05	0.02	373
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.07	0.81	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	198	198	< 0.005	0.01	0.36	201
Vendor	0.02	0.01	0.32	0.14	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	255	255	0.01	0.04	0.30	266
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.15	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	32.8	32.8	< 0.005	< 0.005	0.06	33.3
Vendor	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	42.2	42.2	< 0.005	0.01	0.05	44.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.82	0.69	5.13	10.5	0.02	0.15	—	0.15	0.14	—	0.14	—	1,601	1,601	0.06	0.01	—	1,607
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.82	0.69	5.13	10.5	0.02	0.15	—	0.15	0.14	—	0.14	—	1,601	1,601	0.06	0.01	—	1,607
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.32	0.27	1.99	4.09	0.01	0.06	—	0.06	0.06	—	0.06	—	621	621	0.03	0.01	—	623
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.36	0.75	< 0.005	0.01	—	0.01	0.01	—	0.01	—	103	103	< 0.005	< 0.005	—	103
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.07	1.24	0.00	0.00	0.28	0.28	0.00	0.07	0.07	—	292	292	0.01	0.01	1.07	296
Vendor	0.03	0.01	0.42	0.19	< 0.005	< 0.005	0.09	0.10	< 0.005	0.03	0.03	—	351	351	0.01	0.05	0.92	367
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.10	1.09	0.00	0.00	0.28	0.28	0.00	0.07	0.07	—	270	270	0.01	0.01	0.03	274
Vendor	0.03	0.01	0.44	0.19	< 0.005	< 0.005	0.09	0.10	< 0.005	0.03	0.03	—	351	351	0.01	0.05	0.02	367
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.03	0.41	0.00	0.00	0.11	0.11	0.00	0.02	0.02	—	105	105	< 0.005	< 0.005	0.18	107
Vendor	0.01	< 0.005	0.17	0.07	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	136	136	0.01	0.02	0.15	142

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	17.5	17.5	< 0.005	< 0.005	0.03	17.7
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	22.5	22.5	< 0.005	< 0.005	0.03	23.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Paving (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.26	0.23	1.48	6.89	0.01	0.06	—	0.06	0.06	—	0.06	—	991	991	0.04	0.01	—	995
Paving	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.26	0.23	1.48	6.89	0.01	0.06	—	0.06	0.06	—	0.06	—	991	991	0.04	0.01	—	995
Paving	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.10	0.61	2.85	< 0.005	0.02	—	0.02	0.02	—	0.02	—	410	410	0.02	< 0.005	—	412
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.11	0.52	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	67.9	67.9	< 0.005	< 0.005	—	68.1
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.03	0.45	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	106	106	< 0.005	< 0.005	0.39	108
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.04	0.40	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	98.5	98.5	< 0.005	< 0.005	0.01	99.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.16	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	41.0	41.0	< 0.005	< 0.005	0.07	41.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.79	6.79	< 0.005	< 0.005	0.01	6.89
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.17. Architectural Coating (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	3.82	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	3.82	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.35	0.47	< 0.005	0.01	—	0.01	0.01	—	0.01	—	55.2	55.2	< 0.005	< 0.005	—	55.4
Architectural Coatings	—	1.58	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.06	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.14	9.14	< 0.005	< 0.005	—	9.18
Architectural Coatings	—	0.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.01	0.25	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	58.3	58.3	< 0.005	< 0.005	0.21	59.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.22	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	54.1	54.1	< 0.005	< 0.005	0.01	54.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	22.5	22.5	< 0.005	< 0.005	0.04	22.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.73	3.73	< 0.005	< 0.005	0.01	3.78
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.19. Trenching (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.61	0.51	4.02	4.19	0.01	0.15	—	0.15	0.14	—	0.14	—	605	605	0.02	< 0.005	—	607
Demolition	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.13	0.14	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	20.1	20.1	< 0.005	< 0.005	—	20.2
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.33	3.33	< 0.005	< 0.005	—	3.34
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.05	0.49	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	104	104	< 0.005	< 0.005	0.01	106
Vendor	0.01	< 0.005	0.15	0.06	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	110	110	< 0.005	0.02	0.01	115
Hauling	0.02	< 0.005	0.29	0.11	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	217	217	0.01	0.03	0.01	228
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.49	3.49	< 0.005	< 0.005	0.01	3.55
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.65	3.65	< 0.005	< 0.005	< 0.005	3.82
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	7.23	7.23	< 0.005	< 0.005	0.01	7.59
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.58	0.58	< 0.005	< 0.005	< 0.005	0.59
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.60	0.60	< 0.005	< 0.005	< 0.005	0.63
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.20	1.20	< 0.005	< 0.005	< 0.005	1.26

3.21. Trenching (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.58	0.48	3.93	4.16	0.01	0.14	—	0.14	0.13	—	0.13	—	605	605	0.02	< 0.005	—	607
Demolition	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.58	0.48	3.93	4.16	0.01	0.14	—	0.14	0.13	—	0.13	—	605	605	0.02	< 0.005	—	607
Demolition	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.25	0.21	1.71	1.81	< 0.005	0.06	—	0.06	0.05	—	0.05	—	263	263	0.01	< 0.005	—	264
Demolition	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.04	0.31	0.33	< 0.005	0.01	—	0.01	0.01	—	0.01	—	43.5	43.5	< 0.005	< 0.005	—	43.7
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.03	0.52	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	110	110	< 0.005	< 0.005	0.47	112
Vendor	0.01	< 0.005	0.14	0.06	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	108	108	< 0.005	0.02	0.29	113
Hauling	0.02	< 0.005	0.26	0.10	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	214	214	0.01	0.03	0.47	225

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.04	0.46	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	102	102	< 0.005	< 0.005	0.01	104
Vendor	0.01	< 0.005	0.14	0.06	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	108	108	< 0.005	0.02	0.01	113
Hauling	0.02	< 0.005	0.28	0.11	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	214	214	0.01	0.03	0.01	225
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.19	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	44.8	44.8	< 0.005	< 0.005	0.09	45.5
Vendor	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	47.0	47.0	< 0.005	0.01	0.05	49.2
Hauling	0.01	< 0.005	0.12	0.05	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	93.1	93.1	< 0.005	0.01	0.09	97.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.42	7.42	< 0.005	< 0.005	0.01	7.53
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	7.79	7.79	< 0.005	< 0.005	0.01	8.15
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	15.4	15.4	< 0.005	< 0.005	0.01	16.2

3.23. Trenching (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.23	0.20	1.32	4.03	0.01	0.05	—	0.05	0.05	—	0.05	—	581	581	0.02	< 0.005	—	583
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.12	0.35	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	50.9	50.9	< 0.005	< 0.005	—	51.1
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.43	8.43	< 0.005	< 0.005	—	8.46
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.02	0.36	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	85.0	85.0	< 0.005	< 0.005	0.31	86.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.96	6.96	< 0.005	< 0.005	0.01	7.06
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.15	1.15	< 0.005	< 0.005	< 0.005	1.17
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Asphalt Demolition	Demolition	2/16/2024	3/15/2024	5.00	21.0	—
Site Preparation	Site Preparation	12/15/2023	3/14/2024	5.00	65.0	—
Rough Grading	Grading	3/22/2024	8/2/2024	5.00	96.0	—
Building Construction	Building Construction	8/16/2024	7/17/2026	5.00	501	—
Paving	Paving	1/16/2026	8/16/2026	5.00	151	—
Architectural Coating	Architectural Coating	1/16/2026	8/16/2026	5.00	151	—
Make Ready	Trenching	12/15/2023	8/9/2024	5.00	171	—
Finishing and Landscaping	Trenching	8/16/2026	9/29/2026	5.00	32.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Asphalt Demolition	Rubber Tired Dozers	Diesel	Tier 4 Final	1.00	8.00	367	0.40
Asphalt Demolition	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	2.00	8.00	84.0	0.37
Site Preparation	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41
Site Preparation	Rubber Tired Dozers	Diesel	Tier 4 Final	1.00	7.00	367	0.40
Rough Grading	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41
Rough Grading	Rubber Tired Dozers	Diesel	Tier 4 Final	1.00	8.00	367	0.40
Rough Grading	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	7.00	84.0	0.37
Building Construction	Cranes	Diesel	Tier 4 Final	1.00	4.00	367	0.29

Building Construction	Forklifts	Diesel	Tier 4 Final	1.00	6.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	6.00	84.0	0.37
Building Construction	Welders	Diesel	Average	3.00	8.00	46.0	0.45
Paving	Cement and Mortar Mixers	Diesel	Average	1.00	6.00	10.0	0.56
Paving	Pavers	Diesel	Tier 4 Final	1.00	6.00	81.0	0.42
Paving	Paving Equipment	Diesel	Tier 4 Final	1.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	1.00	7.00	36.0	0.38
Paving	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	8.00	84.0	0.37
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48
Building Construction	Bore/Drill Rigs	Diesel	Tier 4 Final	1.00	1.00	83.0	0.50
Finishing and Landscaping	Forklifts	Diesel	Tier 4 Final	1.00	6.00	82.0	0.20
Finishing and Landscaping	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	8.00	84.0	0.37
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	8.00	84.0	0.37
Rough Grading	Bore/Drill Rigs	Diesel	Tier 4 Final	1.00	1.00	83.0	0.50
Make Ready	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Make Ready	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Make Ready	Plate Compactors	Diesel	Average	1.00	8.00	8.00	0.43
Make Ready	Concrete/Industrial Saws	Diesel	Average	1.00	6.00	33.0	0.73
Finishing and Landscaping	Plate Compactors	Diesel	Average	1.00	8.00	8.00	0.43
Finishing and Landscaping	Rollers	Diesel	Average	1.00	8.00	36.0	0.38

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Asphalt Demolition	—	—	—	—
Asphalt Demolition	Worker	7.50	11.7	LDA,LDT1,LDT2
Asphalt Demolition	Vendor	8.00	8.40	HHDT,MHDT
Asphalt Demolition	Hauling	13.0	20.0	HHDT
Asphalt Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	7.50	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	6.00	8.40	HHDT,MHDT
Site Preparation	Hauling	2.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Rough Grading	—	—	—	—
Rough Grading	Worker	10.0	11.7	LDA,LDT1,LDT2
Rough Grading	Vendor	8.00	8.40	HHDT,MHDT
Rough Grading	Hauling	19.3	20.0	HHDT
Rough Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	34.3	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	13.4	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	12.5	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT

Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	6.86	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT
Make Ready	—	—	—	—
Make Ready	Worker	12.5	11.7	LDA,LDT1,LDT2
Make Ready	Vendor	4.00	8.40	HHDT,MHDT
Make Ready	Hauling	3.00	20.0	HHDT
Make Ready	Onsite truck	—	—	HHDT
Finishing and Landscaping	—	—	—	—
Finishing and Landscaping	Worker	10.0	11.7	LDA,LDT1,LDT2
Finishing and Landscaping	Vendor	—	8.40	HHDT,MHDT
Finishing and Landscaping	Hauling	0.00	20.0	HHDT
Finishing and Landscaping	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%
Sweep paved roads once per month	9%	9%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	122,550	0.00	1,740

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Ton of Debris)	Acres Paved (acres)
Asphalt Demolition	0.00	0.00	0.00	2,200	—
Site Preparation	250	100	60.9	0.00	—
Rough Grading	1,550	13,300	96.0	0.00	—
Paving	0.00	0.00	0.00	0.00	0.67
Make Ready	0.00	0.00	0.00	216	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
University/College (4yr)	0.00	0%
Parking Lot	0.34	100%
Other Non-Asphalt Surfaces	0.32	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2023	0.00	204	0.03	< 0.005
2024	0.00	204	0.03	< 0.005
2026	0.00	204	0.03	< 0.005
2025	0.00	204	0.03	< 0.005

8. User Changes to Default Data

Screen	Justification
Land Use	Based on Applicant info., see assumptions file
Construction: Construction Phases	Based on Applicant info., see assumptions file
Construction: Off-Road Equipment	Based on Applicant info., assume shared equipment, see assumptions file
Construction: Demolition	Bridge demolition assumed to occur during Make Ready phase
Construction: Trips and VMT	Use of tier 4 final equipment, added equipment from similar past development projects, water truck trips calculated and added to vendor trips, see assumptions file
Construction: Architectural Coatings	Exterior of buildings would not be painted, see assumptions file

Appendix B. Air Dispersion Model Output

Control Pathway

Dispersion Options

Titles

New Chemistry Building, UC Berkeley
Construction HRA

Dispersion Options

☑ Regulatory Default ☐ Non-Default Options

Dispersion Coefficient

Urban

Population:
Name (Optional):
Roughness Length:

Output Type

☑ Concentration
☐ Total Deposition (Dry & Wet)
☐ Dry Deposition
☐ Wet Deposition

Plume Depletion

☐ Dry Removal
☐ Wet Removal

Output Warnings

☐ No Output Warnings
☐ Non-fatal Warnings for Non-sequential Met Data

Pollutant / Averaging Time / Terrain Options

Pollutant Type

Averaging Time Options

Hours

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 6 ☐ 8 ☐ 12 ☐ 24

☐ Month ☑ Period ☐ Annual

Exponential Decay

Half-life values will be used

Terrain Height Options

☐ Flat ☑ Elevated

SO: Meters
RE: Meters
TG: Meters

Flagpole Receptors

☑ Yes ☐ No

Default Height = 1.50 m

Control Pathway

Optional Files

Re-Start File	Init File	Multi-Year Analyses	Event Input File	Error Listing File
☐	☐	☐	☐	■

Detailed Error Listing File

Filename: UCB_013.err

Source Pathway - Source Inputs

Source Pathway - Source Inputs

Polygon Area Sources

Source Type: AREA POLY

Source: PAREA1 (on-site area)

Base Elevation (Optional)	Release Height [m]	Emission Rate [g/ (s-m^2)]	Initial Vertical Dim. [m]	Number of Vertices (or sides)	X Coordinate for Vertices [m]	Y Coordinate for Vertices [m]
106.02	4.15	0.00022	1.93	32	565478.40	4192002.74
		0.00022			565520.73	4192037.93
		0.00022			565507.58	4192055.95
		0.00022			565493.85	4192078.26
		0.00022			565479.83	4192102.00
		0.00022			565481.55	4192110.01
		0.00022			565478.97	4192118.87
		0.00022			565489.56	4192128.31
		0.00022			565477.26	4192145.47
		0.00022			565463.81	4192136.32
		0.00022			565472.97	4192122.30
		0.00022			565462.96	4192116.30
		0.00022			565469.53	4192102.28
		0.00022			565471.25	4192089.41
		0.00022			565471.25	4192085.12
		0.00022			565470.39	4192077.68
		0.00022			565466.39	4192071.11
		0.00022			565460.67	4192065.38
		0.00022			565452.09	4192060.81
		0.00022			565446.37	4192059.38
		0.00022			565449.23	4192051.94
		0.00022			565418.33	4192041.64
		0.00022			565420.05	4192039.36
		0.00022			565429.20	4192041.64
		0.00022			565434.64	4192043.07
		0.00022			565439.79	4192041.36
		0.00022			565446.37	4192035.92
		0.00022			565448.37	4192028.77
		0.00022			565446.37	4192023.05
		0.00022			565440.36	4192020.48

Source Pathway - Source Inputs

Source Type: AREA POLY

Source: PAREA1 (on-site area)

Base Elevation (Optional)	Release Height [m]	Emission Rate [g/ (s-m^2)]	Initial Vertical Dim. [m]	Number of Vertices (or sides)	X Coordinate for Vertices [m]	Y Coordinate for Vertices [m]
		0.00022			565441.50	4192016.76
		0.00022			565471.82	4192024.77

Line Volume Sources

Source Type: LINE VOLUME

Source: SLINE1 (haul route)

Length of Side [m]	Emission Rate [g/ s]	Building Height [m]	X Coordinate for Points [m]	Y Coordinate for points [m]	Base Elevation [m]	Release Height [m]
10.00	1.00000		565517.91	4192038.80	113.63	4.15
			565492.57	4192072.59	114.97	4.15
			565481.01	4192091.71	116.92	4.15
			565465.45	4192120.16	118.48	4.15
			565449.88	4192140.17	117.65	4.15
			565437.88	4192159.29	117.98	4.15
			565425.43	4192173.97	116.86	4.15
			565421.87	4192181.52	120.53	4.15
			565406.75	4192196.64	118.81	4.15
			565387.63	4192216.21	121.38	4.15
			565372.96	4192238.44	122.57	4.15
			565359.62	4192264.67	121.51	4.15
			565143.53	4192227.77	103.28	4.15
			564987.46	4192201.09	92.38	4.15

Source Pathway - Source Inputs

Volume Sources Generated from Line Sources

Line Source ID	Volume Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation [m]	Release Height [m[	Emission Rate [g/s]	Length of Side [m]	Building Height [m]	Initial Lateral Dimencion [m]	Initial Vertical Dimencion [m]
SLINE1	L0000001	565514.91	4192042.80	113.79	4.15	0.01538	10.00		4.65	3.26
	L0000002	565508.91	4192050.80	114.16	4.15	0.01538	10.00		4.65	3.26
	L0000003	565502.91	4192058.80	114.63	4.15	0.01538	10.00		4.65	3.26
	L0000004	565496.91	4192066.80	115.24	4.15	0.01538	10.00		4.65	3.26
	L0000005	565491.14	4192074.95	115.58	4.15	0.01538	10.00		4.65	3.26
	L0000006	565485.97	4192083.51	115.92	4.15	0.01538	10.00		4.65	3.26
	L0000007	565480.81	4192092.07	116.31	4.15	0.01538	10.00		4.65	3.26
	L0000008	565476.01	4192100.85	116.79	4.15	0.01538	10.00		4.65	3.26
	L0000009	565471.21	4192109.62	117.07	4.15	0.01538	10.00		4.65	3.26
	L0000010	565466.41	4192118.40	117.42	4.15	0.01538	10.00		4.65	3.26
	L0000011	565460.54	4192126.47	117.72	4.15	0.01538	10.00		4.65	3.26
	L0000012	565454.40	4192134.36	117.69	4.15	0.01538	10.00		4.65	3.26
	L0000013	565448.48	4192142.40	117.74	4.15	0.01538	10.00		4.65	3.26
	L0000014	565443.16	4192150.87	117.92	4.15	0.01538	10.00		4.65	3.26
	L0000015	565437.84	4192159.34	118.15	4.15	0.01538	10.00		4.65	3.26
	L0000016	565431.37	4192166.96	118.34	4.15	0.01538	10.00		4.65	3.26
	L0000017	565425.08	4192174.70	118.57	4.15	0.01538	10.00		4.65	3.26
	L0000018	565420.13	4192183.27	119.15	4.15	0.01538	10.00		4.65	3.26
	L0000019	565413.06	4192190.34	119.25	4.15	0.01538	10.00		4.65	3.26
	L0000020	565406.00	4192197.42	119.51	4.15	0.01538	10.00		4.65	3.26
	L0000021	565399.01	4192204.57	119.88	4.15	0.01538	10.00		4.65	3.26
	L0000022	565392.02	4192211.72	120.35	4.15	0.01538	10.00		4.65	3.26
	L0000023	565385.58	4192219.32	121.06	4.15	0.01538	10.00		4.65	3.26
	L0000024	565380.07	4192227.66	121.51	4.15	0.01538	10.00		4.65	3.26

Source Pathway - Source Inputs

AERMOD

Line Source ID	Volume Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation [m]	Release Height [m[	Emission Rate [g/s]	Length of Side [m]	Building Height [m]	Initial Lateral Dimencion [m]	Initial Vertical Dimencion [m]
SLINE1	L0000025	565374.56	4192236.01	121.67	4.15	0.01538	10.00		4.65	3.26
	L0000026	565369.75	4192244.76	121.96	4.15	0.01538	10.00		4.65	3.26
	L0000027	565365.22	4192253.67	122.23	4.15	0.01538	10.00		4.65	3.26
	L0000028	565360.68	4192262.59	121.70	4.15	0.01538	10.00		4.65	3.26
	L0000029	565352.07	4192263.38	120.41	4.15	0.01538	10.00		4.65	3.26
	L0000030	565342.21	4192261.70	118.89	4.15	0.01538	10.00		4.65	3.26
	L0000031	565332.36	4192260.01	117.51	4.15	0.01538	10.00		4.65	3.26
	L0000032	565322.50	4192258.33	116.33	4.15	0.01538	10.00		4.65	3.26
	L0000033	565312.64	4192256.65	115.12	4.15	0.01538	10.00		4.65	3.26
	L0000034	565302.78	4192254.96	114.63	4.15	0.01538	10.00		4.65	3.26
	L0000035	565292.93	4192253.28	114.16	4.15	0.01538	10.00		4.65	3.26
	L0000036	565283.07	4192251.60	113.77	4.15	0.01538	10.00		4.65	3.26
	L0000037	565273.21	4192249.91	113.45	4.15	0.01538	10.00		4.65	3.26
	L0000038	565263.36	4192248.23	113.17	4.15	0.01538	10.00		4.65	3.26
	L0000039	565253.50	4192246.55	112.62	4.15	0.01538	10.00		4.65	3.26
	L0000040	565243.64	4192244.86	112.07	4.15	0.01538	10.00		4.65	3.26
	L0000041	565233.78	4192243.18	111.41	4.15	0.01538	10.00		4.65	3.26
	L0000042	565223.93	4192241.50	110.67	4.15	0.01538	10.00		4.65	3.26
	L0000043	565214.07	4192239.81	109.95	4.15	0.01538	10.00		4.65	3.26
	L0000044	565204.21	4192238.13	109.01	4.15	0.01538	10.00		4.65	3.26
	L0000045	565194.35	4192236.45	108.09	4.15	0.01538	10.00		4.65	3.26
	L0000046	565184.50	4192234.76	107.21	4.15	0.01538	10.00		4.65	3.26
	L0000047	565174.64	4192233.08	106.39	4.15	0.01538	10.00		4.65	3.26
	L0000048	565164.78	4192231.40	105.58	4.15	0.01538	10.00		4.65	3.26
	L0000049	565154.93	4192229.71	104.63	4.15	0.01538	10.00		4.65	3.26

Source Pathway - Source Inputs

AERMOD

Line Source ID	Volume Source ID	X Coordinate [m]	Y Coordinate [m]	Base Elevation [m]	Release Height [m[	Emission Rate [g/s]	Length of Side [m]	Building Height [m]	Initial Lateral Dimencion [m]	Initial Vertical Dimencion [m]
SLINE1	L0000050	565145.07	4192228.03	103.75	4.15	0.01538	10.00		4.65	3.26
	L0000051	565135.21	4192226.34	102.81	4.15	0.01538	10.00		4.65	3.26
	L0000052	565125.35	4192224.66	101.82	4.15	0.01538	10.00		4.65	3.26
	L0000053	565115.50	4192222.97	100.80	4.15	0.01538	10.00		4.65	3.26
	L0000054	565105.64	4192221.29	99.65	4.15	0.01538	10.00		4.65	3.26
	L0000055	565095.78	4192219.60	98.52	4.15	0.01538	10.00		4.65	3.26
	L0000056	565085.93	4192217.92	97.50	4.15	0.01538	10.00		4.65	3.26
	L0000057	565076.07	4192216.23	96.55	4.15	0.01538	10.00		4.65	3.26
	L0000058	565066.21	4192214.55	95.67	4.15	0.01538	10.00		4.65	3.26
	L0000059	565056.35	4192212.86	94.99	4.15	0.01538	10.00		4.65	3.26
	L0000060	565046.50	4192211.18	94.26	4.15	0.01538	10.00		4.65	3.26
	L0000061	565036.64	4192209.49	93.68	4.15	0.01538	10.00		4.65	3.26
	L0000062	565026.78	4192207.81	93.06	4.15	0.01538	10.00		4.65	3.26
	L0000063	565016.93	4192206.12	92.48	4.15	0.01538	10.00		4.65	3.26
	L0000064	565007.07	4192204.44	92.26	4.15	0.01538	10.00		4.65	3.26
	L0000065	564997.21	4192202.75	91.98	4.15	0.01538	10.00		4.65	3.26

Source Pathway

Building Downwash Information

Option not in use

Emission Rate Units for Output

For Concentration

Unit Factor:	1E6
Emission Unit Label:	GRAMS/SEC
Concentration Unit Label:	MICROGRAMS/M**3

Source Groups

Source Group ID: onsite	List of Sources in Group (Source Range or Single Sources)
	PAREA1

Source Group ID: HAUL	List of Sources in Group (Source Range or Single Sources)
	SLINE1

Variable Emissions

Source Pathway

Hour-of-Day / Day-of-Week Emission Rate Variation

Scenario: workhours

Source ID:		**SLINE1**						
Weekdays								
	Hour	1 - 6	0.00	0.00	0.00	0.00	0.00	0.00
	of	7 - 12	0.00	1.00	1.00	1.00	1.00	0.50
	Day	13 - 18	0.50	1.00	1.00	1.00	0.00	0.00
		19 - 24	0.00	0.00	0.00	0.00	0.00	0.00
Saturday								
	Hour	1 - 6	0.00	0.00	0.00	0.00	0.00	0.00
	of	7 - 12	0.00	0.00	0.00	0.00	0.00	0.00
	Day	13 - 18	0.00	0.00	0.00	0.00	0.00	0.00
		19 - 24	0.00	0.00	0.00	0.00	0.00	0.00
Sunday								
	Hour	1 - 6	0.00	0.00	0.00	0.00	0.00	0.00
	of	7 - 12	0.00	0.00	0.00	0.00	0.00	0.00
	Day	13 - 18	0.00	0.00	0.00	0.00	0.00	0.00
		19 - 24	0.00	0.00	0.00	0.00	0.00	0.00
Source ID:		**PAREA1**						
Weekdays								
	Hour	1 - 6	0.00	0.00	0.00	0.00	0.00	0.00
	of	7 - 12	0.00	1.00	1.00	1.00	1.00	0.50
	Day	13 - 18	0.50	1.00	1.00	1.00	0.00	0.00
		19 - 24	0.00	0.00	0.00	0.00	0.00	0.00
Saturday								
	Hour	1 - 6	0.00	0.00	0.00	0.00	0.00	0.00
	of	7 - 12	0.00	0.00	0.00	0.00	0.00	0.00
	Day	13 - 18	0.00	0.00	0.00	0.00	0.00	0.00
		19 - 24	0.00	0.00	0.00	0.00	0.00	0.00
Sunday								
	Hour	1 - 6	0.00	0.00	0.00	0.00	0.00	0.00
	of	7 - 12	0.00	0.00	0.00	0.00	0.00	0.00
	Day	13 - 18	0.00	0.00	0.00	0.00	0.00	0.00
		19 - 24	0.00	0.00	0.00	0.00	0.00	0.00

Meteorology Pathway

Met Input Data

Surface Met Data

Filename: met\KOAK_2013-2017.SFC
Format Type: Default AERMET format

Profile Met Data

Filename: met\KOAK_2013-2017.PFL
Format Type: Default AERMET format

Wind Speed

☐ Wind Speeds are Vector Mean (Not Scalar Means)

Wind Direction

Rotation Adjustment [deg]:

Potential Temperature Profile

Base Elevation above MSL (for Primary Met Tower): 1.80 [m]

Meteorological Station Data

Stations	Station No.	Year	X Coordinate [m]	Y Coordinate [m]	Station Name
Surface		2013			OAKLAND/WSO AP
Upper Air		2013			OAKLAND/WSO AP

Data Period

Data Period to Process

Start Date: 1/1/2013 Start Hour: 1 End Date: 12/31/2017 End Hour: 24

Wind Speed Categories

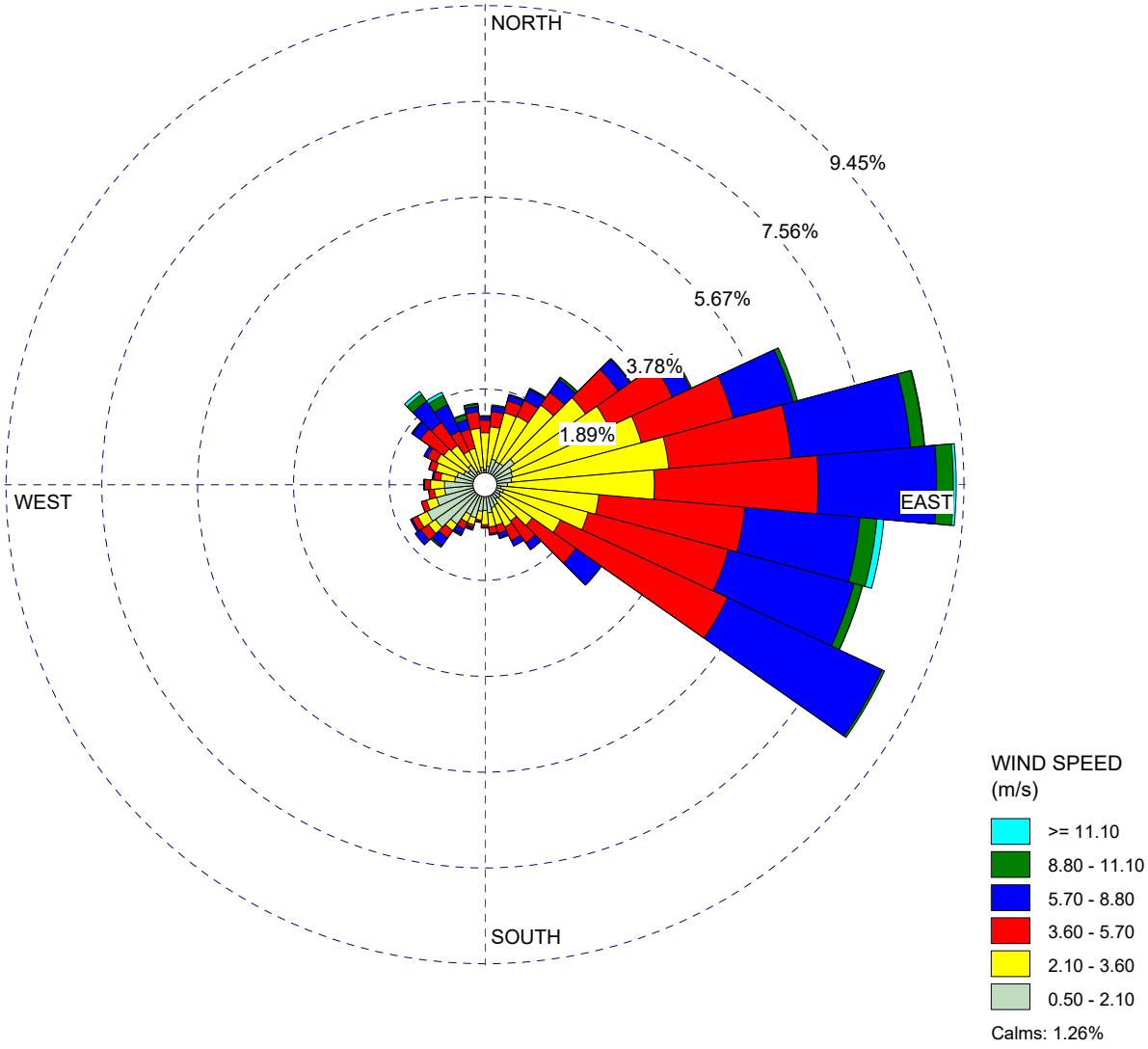
Stability Category	Wind Speed [m/s]	Stability Category	Wind Speed [m/s]
A	1.54	D	8.23
B	3.09	E	10.8
C	5.14	F	No Upper Bound

WIND ROSE PLOT:

Oakland International Airport

DISPLAY:

Wind Speed
Flow Vector (blowing to)



COMMENTS: Oakland Airport 1.8 m anem height Work Hours 7AM-4PM	DATA PERIOD: **Start Date: 1/1/2013 - 06:00** **End Date: 12/31/2017 - 15:00**	COMPANY NAME: **PlaceWorks**	
		MODELER: **SB**	
	CALM WINDS: **1.26%**	TOTAL COUNT: **18220 hrs.**	
	AVG. WIND SPEED: **3.93 m/s**	DATE: **1/3/2023**	PROJECT NO.: **UCB-01.3**

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: HAUL ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
565074.97	4192230.78	11.04372	565076.78	4192249.89	5.90388
565087.86	4192240.84	8.36171	565112.86	4192240.84	9.99936
564987.86	4192265.84	1.31962	565018.74	4192266.75	1.67995
565043.74	4192266.75	2.30027	565087.86	4192265.84	4.32912
565112.86	4192265.84	4.99366	564987.86	4192290.84	1.00705
565018.74	4192291.75	1.22662	565043.74	4192291.75	1.58587
565087.86	4192290.84	2.68852	565112.86	4192290.84	3.07736
565422.36	4192290.84	4.23386	565446.91	4192295.82	3.06004
565462.86	4192290.84	2.85754 MER Location	565487.86	4192290.84	2.31389
565512.86	4192290.84	1.88454	564987.86	4192315.84	0.82540
565087.86	4192315.84	1.84929	565112.86	4192315.84	2.10970
565421.01	4192324.89	2.26128	565440.12	4192325.80	1.98505
565462.86	4192315.84	2.01610	565487.86	4192315.84	1.69667
565512.86	4192315.84	1.42365	564987.86	4192340.84	0.70153
565062.86	4192340.84	1.18904	565087.86	4192340.84	1.36052
565112.86	4192340.84	1.53803	565137.86	4192340.84	1.70439
565162.86	4192340.84	1.85309	565462.86	4192340.84	1.40251
565487.86	4192340.84	1.20638	565512.86	4192340.84	1.04664
564987.86	4192365.84	0.61396	565062.86	4192365.84	0.94208
565087.86	4192365.84	1.05277	565112.86	4192365.84	1.18030
565137.86	4192365.84	1.30650	565162.86	4192365.84	1.41828
565187.86	4192365.84	1.52184	565212.86	4192365.84	1.61904
565237.86	4192365.84	1.69262	565262.86	4192365.84	1.74700
565287.86	4192365.84	1.79587	565462.86	4192365.84	1.03232
565487.86	4192365.84	0.90249	564987.86	4192390.84	0.54806
565062.86	4192390.84	0.77238	565087.86	4192390.84	0.84832
565112.86	4192390.84	0.93587	565137.86	4192390.84	1.03017
565162.86	4192390.84	1.11935	565187.86	4192390.84	1.19315
565212.86	4192390.84	1.25639	565237.86	4192390.84	1.29864
565262.86	4192390.84	1.32057	565287.86	4192390.84	1.32030
565312.86	4192390.84	1.27103	565337.86	4192390.84	1.22938
565362.86	4192390.84	1.17204	565387.86	4192390.84	1.06904
565412.86	4192390.84	0.96589	565437.86	4192390.84	0.87461
565462.86	4192390.84	0.79197	565487.86	4192390.84	0.70544

564987.86	4192415.84	0.48757	565037.86	4192415.84	0.59596
565062.86	4192415.84	0.64958	565087.86	4192415.84	0.70413
565112.86	4192415.84	0.76368	565137.86	4192415.84	0.82898
565162.86	4192415.84	0.89730	565187.86	4192415.84	0.95350
565212.86	4192415.84	0.99883	565237.86	4192415.84	1.02735
565262.86	4192415.84	1.02900	565287.86	4192415.84	1.01120

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: HAUL ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
565312.86	4192415.84	0.95945	565337.86	4192415.84	0.93040
565362.86	4192415.84	0.88185	565387.86	4192415.84	0.81209
565412.86	4192415.84	0.74281	565437.86	4192415.84	0.68372
565462.86	4192415.84	0.63024	565487.86	4192415.84	0.57291
564987.86	4192440.84	0.43251	565012.86	4192440.84	0.47351
565037.86	4192440.84	0.51563	565062.86	4192440.84	0.55662
565087.86	4192440.84	0.59681	565112.86	4192440.84	0.63898
565137.86	4192440.84	0.68187	565162.86	4192440.84	0.72594
565187.86	4192440.84	0.76725	565212.86	4192440.84	0.80601
565237.86	4192440.84	0.83128	565262.86	4192440.84	0.82809
565287.86	4192440.84	0.80266	565312.86	4192440.84	0.76061
565337.86	4192440.84	0.73468	565362.86	4192440.84	0.69312
565387.86	4192440.84	0.64131	565412.86	4192440.84	0.59157
565437.86	4192440.84	0.55307	565462.86	4192440.84	0.52178
565487.86	4192440.84	0.48336	564987.86	4192465.84	0.38701
565012.86	4192465.84	0.41900	565037.86	4192465.84	0.45137
565062.86	4192465.84	0.48205	565087.86	4192465.84	0.51133
565112.86	4192465.84	0.54350	565137.86	4192465.84	0.57110
565162.86	4192465.84	0.59740	565187.86	4192465.84	0.62402
565212.86	4192465.84	0.64578	565237.86	4192465.84	0.66180
565262.86	4192465.84	0.67324	565287.86	4192465.84	0.66497
565312.86	4192465.84	0.64255	565337.86	4192465.84	0.61125
565362.86	4192465.84	0.58235	565387.86	4192465.84	0.54003
565412.86	4192465.84	0.49999	565437.86	4192465.84	0.48182
565462.86	4192465.84	0.46249	565487.86	4192465.84	0.43398
564987.86	4192490.84	0.34874	565012.86	4192490.84	0.37389
565037.86	4192490.84	0.39887	565062.86	4192490.84	0.42226
565087.86	4192490.84	0.44347	565112.86	4192490.84	0.46542
565137.86	4192490.84	0.48236	565162.86	4192490.84	0.49606
565187.86	4192490.84	0.51350	565212.86	4192490.84	0.51970
565237.86	4192490.84	0.51964	565262.86	4192490.84	0.52152
565287.86	4192490.84	0.51619	565312.86	4192490.84	0.50763
565337.86	4192490.84	0.49232	565362.86	4192490.84	0.47466
565387.86	4192490.84	0.45328	565412.86	4192490.84	0.42815

565437.86	4192490.84	0.39706	565462.86	4192490.84	0.36374
565487.86	4192490.84	0.34885	564987.86	4192515.84	0.31543
565012.86	4192515.84	0.33515	565037.86	4192515.84	0.35471
565062.86	4192515.84	0.37296	565087.86	4192515.84	0.38892
565112.86	4192515.84	0.40361	565137.86	4192515.84	0.41341
565162.86	4192515.84	0.41754	565187.86	4192515.84	0.42605

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: HAUL ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
565212.86	4192515.84	0.42382	565237.86	4192515.84	0.41641
565262.86	4192515.84	0.41391	565287.86	4192515.84	0.41153
565312.86	4192515.84	0.40709	565337.86	4192515.84	0.39727
565362.86	4192515.84	0.38124	565387.86	4192515.84	0.36240
565412.86	4192515.84	0.34098	565437.86	4192515.84	0.31357
565462.86	4192515.84	0.28759	565487.86	4192515.84	0.27656
564987.86	4192540.84	0.28572	565012.86	4192540.84	0.30127
565037.86	4192540.84	0.31658	565062.86	4192540.84	0.32981
565087.86	4192540.84	0.34242	565112.86	4192540.84	0.35289
565137.86	4192540.84	0.35834	565162.86	4192540.84	0.35795
565187.86	4192540.84	0.35920	565212.86	4192540.84	0.35287
565237.86	4192540.84	0.34435	565262.86	4192540.84	0.33895
565287.86	4192540.84	0.33571	565312.86	4192540.84	0.33250
565337.86	4192540.84	0.32465	565362.86	4192540.84	0.30984
565387.86	4192540.84	0.29230	565412.86	4192540.84	0.27380
565437.86	4192540.84	0.25417	565462.86	4192540.84	0.23698
565487.86	4192540.84	0.22672	565075.64	4192230.54	8.01800
565077.45	4192249.65	4.47450	565088.52	4192240.60	6.21138
565088.52	4192265.60	3.47445	565120.21	4192259.61	6.02033
565120.47	4192259.38	4.62658	565113.12	4192240.61	7.30122
565113.12	4192265.61	3.93586	565422.45	4192290.89	3.31803
565447.00	4192295.86	2.54234	565462.95	4192290.89	2.41370
565487.95	4192290.89	2.01446	565421.10	4192324.94	1.91026
565440.21	4192325.84	1.71411	565462.95	4192315.89	1.75505
565462.95	4192340.89	1.25497			

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ONSITE ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC		X-COORD (M)	Y-COORD (M)	CONC
565074.97	4192230.78	0.25456		565076.78	4192249.89	0.25448
565087.86	4192240.84	0.26976		565112.86	4192240.84	0.30721
564987.86	4192265.84	0.18208		565018.74	4192266.75	0.20320
565043.74	4192266.75	0.22325		565087.86	4192265.84	0.26585
565112.86	4192265.84	0.30069		564987.86	4192290.84	0.17927
565018.74	4192291.75	0.19931		565043.74	4192291.75	0.22077
565087.86	4192290.84	0.26143		565112.86	4192290.84	0.29266
565422.36	4192290.84	0.62654		565446.91	4192295.82	0.61007
565462.86	4192290.84	0.62950	MER LOCATION	565487.86	4192290.84	0.60499
565512.86	4192290.84	0.57873		564987.86	4192315.84	0.17578
565087.86	4192315.84	0.25589		565112.86	4192315.84	0.28324
565421.01	4192324.89	0.47852		565440.12	4192325.80	0.47912
565462.86	4192315.84	0.51145		565487.86	4192315.84	0.48639
565512.86	4192315.84	0.46172		564987.86	4192340.84	0.17224
565062.86	4192340.84	0.22703		565087.86	4192340.84	0.24851
565112.86	4192340.84	0.27243		565137.86	4192340.84	0.29813
565162.86	4192340.84	0.32198		565462.86	4192340.84	0.41489
565487.86	4192340.84	0.39048		565512.86	4192340.84	0.37136
564987.86	4192365.84	0.16881		565062.86	4192365.84	0.21842
565087.86	4192365.84	0.23675		565112.86	4192365.84	0.25733
565137.86	4192365.84	0.27876		565162.86	4192365.84	0.29886
565187.86	4192365.84	0.31548		565212.86	4192365.84	0.32905
565237.86	4192365.84	0.33752		565262.86	4192365.84	0.34340
565287.86	4192365.84	0.34898		565462.86	4192365.84	0.34466
565487.86	4192365.84	0.32358		564987.86	4192390.84	0.16543
565062.86	4192390.84	0.20766		565087.86	4192390.84	0.22283
565112.86	4192390.84	0.23967		565137.86	4192390.84	0.25759
565162.86	4192390.84	0.27360		565187.86	4192390.84	0.28558
565212.86	4192390.84	0.29430		565237.86	4192390.84	0.29878
565262.86	4192390.84	0.30056		565287.86	4192390.84	0.30101
565312.86	4192390.84	0.29718		565337.86	4192390.84	0.29720
565362.86	4192390.84	0.29974		565387.86	4192390.84	0.30214
565412.86	4192390.84	0.30578		565437.86	4192390.84	0.30348
565462.86	4192390.84	0.29133		565487.86	4192390.84	0.27457
564987.86	4192415.84	0.16082		565037.86	4192415.84	0.18433
565062.86	4192415.84	0.19652		565087.86	4192415.84	0.20955
565112.86	4192415.84	0.22155		565137.86	4192415.84	0.23417

565162.86	4192415.84	0.24677	565187.86	4192415.84	0.25593
565212.86	4192415.84	0.26248	565237.86	4192415.84	0.26543
565262.86	4192415.84	0.26443	565287.86	4192415.84	0.26205

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ONSITE ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
565312.86	4192415.84	0.25646	565337.86	4192415.84	0.25617
565362.86	4192415.84	0.25775	565387.86	4192415.84	0.26068
565412.86	4192415.84	0.26346	565437.86	4192415.84	0.26052
565462.86	4192415.84	0.25058	565487.86	4192415.84	0.23790
564987.86	4192440.84	0.15482	565012.86	4192440.84	0.16472
565037.86	4192440.84	0.17501	565062.86	4192440.84	0.18574
565087.86	4192440.84	0.19460	565112.86	4192440.84	0.20307
565137.86	4192440.84	0.21116	565162.86	4192440.84	0.21923
565187.86	4192440.84	0.22639	565212.86	4192440.84	0.23302
565237.86	4192440.84	0.23674	565262.86	4192440.84	0.23499
565287.86	4192440.84	0.23055	565312.86	4192440.84	0.22505
565337.86	4192440.84	0.22437	565362.86	4192440.84	0.22541
565387.86	4192440.84	0.22813	565412.86	4192440.84	0.22973
565437.86	4192440.84	0.22688	565462.86	4192440.84	0.22003
565487.86	4192440.84	0.21069	564987.86	4192465.84	0.14848
565012.86	4192465.84	0.15686	565037.86	4192465.84	0.16595
565062.86	4192465.84	0.17319	565087.86	4192465.84	0.17937
565112.86	4192465.84	0.18575	565137.86	4192465.84	0.19045
565162.86	4192465.84	0.19494	565187.86	4192465.84	0.19981
565212.86	4192465.84	0.20369	565237.86	4192465.84	0.20618
565262.86	4192465.84	0.20807	565287.86	4192465.84	0.20677
565312.86	4192465.84	0.20428	565337.86	4192465.84	0.20220
565362.86	4192465.84	0.20461	565387.86	4192465.84	0.20643
565412.86	4192465.84	0.20655	565437.86	4192465.84	0.20624
565462.86	4192465.84	0.20128	565487.86	4192465.84	0.19365
564987.86	4192490.84	0.14188	565012.86	4192490.84	0.14935
565037.86	4192490.84	0.15563	565062.86	4192490.84	0.16092
565087.86	4192490.84	0.16496	565112.86	4192490.84	0.16893
565137.86	4192490.84	0.17138	565162.86	4192490.84	0.17302
565187.86	4192490.84	0.17643	565212.86	4192490.84	0.17726
565237.86	4192490.84	0.17706	565262.86	4192490.84	0.17755
565287.86	4192490.84	0.17707	565312.86	4192490.84	0.17659
565337.86	4192490.84	0.17734	565362.86	4192490.84	0.18118
565387.86	4192490.84	0.18564	565412.86	4192490.84	0.18652
565437.86	4192490.84	0.18032	565462.86	4192490.84	0.17014
565487.86	4192490.84	0.16576	564987.86	4192515.84	0.13500
565012.86	4192515.84	0.14061	565037.86	4192515.84	0.14537

565062.86	4192515.84	0.14916	565087.86	4192515.84	0.15200
565112.86	4192515.84	0.15425	565137.86	4192515.84	0.15510
565162.86	4192515.84	0.15457	565187.86	4192515.84	0.15632

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ONSITE ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
565212.86	4192515.84	0.15549	565237.86	4192515.84	0.15377
565262.86	4192515.84	0.15308	565287.86	4192515.84	0.15267
565312.86	4192515.84	0.15315	565337.86	4192515.84	0.15505
565362.86	4192515.84	0.15829	565387.86	4192515.84	0.16129
565412.86	4192515.84	0.16042	565437.86	4192515.84	0.15337
565462.86	4192515.84	0.14400	565487.86	4192515.84	0.14014
564987.86	4192540.84	0.12786	565012.86	4192540.84	0.13174
565037.86	4192540.84	0.13514	565062.86	4192540.84	0.13762
565087.86	4192540.84	0.13969	565112.86	4192540.84	0.14120
565137.86	4192540.84	0.14117	565162.86	4192540.84	0.13986
565187.86	4192540.84	0.13984	565212.86	4192540.84	0.13808
565237.86	4192540.84	0.13546	565262.86	4192540.84	0.13371
565287.86	4192540.84	0.13306	565312.86	4192540.84	0.13408
565337.86	4192540.84	0.13650	565362.86	4192540.84	0.13915
565387.86	4192540.84	0.14074	565412.86	4192540.84	0.13875
565437.86	4192540.84	0.13232	565462.86	4192540.84	0.12471
565487.86	4192540.84	0.12047	565075.64	4192230.54	0.25978
565077.45	4192249.65	0.25933	565088.52	4192240.60	0.27456
565088.52	4192265.60	0.27004	565120.21	4192259.61	0.31394
565120.47	4192259.38	0.31286	565113.12	4192240.61	0.30878
565113.12	4192265.61	0.30169	565422.45	4192290.89	0.56811
565447.00	4192295.86	0.55754	565462.95	4192290.89	0.57646
565487.95	4192290.89	0.55791	565421.10	4192324.94	0.44000
565440.21	4192325.84	0.44243	565462.95	4192315.89	0.47269
565462.95	4192340.89	0.38683			

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE SUMMARY OF MAXIMUM PERIOD (43824 HRS) RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
HAUL	1ST HIGHEST VALUE IS	11.04372 AT (565074.97, 4192230.78, 96.60, 580.55, 1.50)	DC	
	2ND HIGHEST VALUE IS	9.99936 AT (565112.86, 4192240.84, 100.64, 580.55, 1.50)	DC	
	3RD HIGHEST VALUE IS	8.36171 AT (565087.86, 4192240.84, 97.78, 580.55, 1.50)	DC	
	4TH HIGHEST VALUE IS	8.01800 AT (565075.64, 4192230.54, 96.66, 580.55, 6.10)	DC	
	5TH HIGHEST VALUE IS	7.30122 AT (565113.12, 4192240.61, 100.67, 580.55, 6.10)	DC	
	6TH HIGHEST VALUE IS	6.21138 AT (565088.52, 4192240.60, 97.83, 580.55, 6.10)	DC	
	7TH HIGHEST VALUE IS	6.02033 AT (565120.21, 4192259.61, 101.52, 580.55, 1.50)	DC	
	8TH HIGHEST VALUE IS	5.90388 AT (565076.78, 4192249.89, 97.09, 580.55, 1.50)	DC	
	9TH HIGHEST VALUE IS	4.99366 AT (565112.86, 4192265.84, 100.80, 580.55, 1.50)	DC	
	10TH HIGHEST VALUE IS	4.62658 AT (565120.47, 4192259.38, 101.55, 580.55, 6.10)	DC	
		MER LOCATION		
ONSITE	1ST HIGHEST VALUE IS	0.62950 AT (565462.86, 4192290.84, 136.23, 580.55, 1.50)	DC	
	2ND HIGHEST VALUE IS	0.62654 AT (565422.36, 4192290.84, 130.84, 580.55, 1.50)	DC	
	3RD HIGHEST VALUE IS	0.61007 AT (565446.91, 4192295.82, 134.44, 580.55, 1.50)	DC	
	4TH HIGHEST VALUE IS	0.60499 AT (565487.86, 4192290.84, 139.40, 580.55, 1.50)	DC	
	5TH HIGHEST VALUE IS	0.57873 AT (565512.86, 4192290.84, 143.32, 580.55, 1.50)	DC	
	6TH HIGHEST VALUE IS	0.57646 AT (565462.95, 4192290.89, 136.24, 580.55, 6.10)	DC	
	7TH HIGHEST VALUE IS	0.56811 AT (565422.45, 4192290.89, 130.86, 580.55, 6.10)	DC	
	8TH HIGHEST VALUE IS	0.55791 AT (565487.95, 4192290.89, 139.41, 580.55, 6.10)	DC	
	9TH HIGHEST VALUE IS	0.55754 AT (565447.00, 4192295.86, 134.46, 580.55, 6.10)	DC	
	10TH HIGHEST VALUE IS	0.51145 AT (565462.86, 4192315.84, 137.70, 580.55, 1.50)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 2 Warning Message(s)
A Total of 1143 Informational Message(s)

A Total of 43824 Hours Were Processed

A Total of 760 Calm Hours Identified

A Total of 383 Missing Hours Identified (0.87 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
ME W186 1053 MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used 0.50
ME W187 1053 MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

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*** AERMOD Finishes Successfully ***
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Appendix C. Construction Risk Calculations

Table C1
MEIR Concentrations for Risk Calculations

Contaminant	Source		Model Output [1] ($\mu g/m^3$)	Emission Rates [2] (g/s)	MEIR Conc. ($\mu g/m^3$)	Total MEIR Conc. Annual Average ($\mu g/m^3$)
(a)	(b)		(c)	(d)	(e)	(f)
Residential Receptors			**LRDP MM AIR-2.1**			
DPM	2023	On-Site Emissions	0.63	3.35E-03	2.11E-03	2.12E-03
		Truck Route	2.86	3.64E-06	1.04E-05	
	2024	On-Site Emissions	0.63	2.87E-03	1.80E-03	1.82E-03
		Truck Route	2.86	5.84E-06	1.67E-05	
	2025	On-Site Emissions	0.63	2.71E-03	1.71E-03	1.71E-03
		Truck Route	2.86	1.59E-06	4.54E-06	
	2026	On-Site Emissions	0.63	2.92E-03	1.84E-03	1.84E-03
		Truck Route	2.86	1.16E-06	3.31E-06	
PM2.5	2023	On-Site Emissions	0.63	2.36E-02	1.48E-02	1.49E-02
		Truck Route	2.86	3.25E-05	9.27E-05	
	2024	On-Site Emissions	0.63	1.44E-02	9.08E-03	9.21E-03
		Truck Route	2.86	4.56E-05	1.30E-04	
	2025	On-Site Emissions	0.63	2.52E-03	1.58E-03	1.67E-03
		Truck Route	2.86	3.04E-05	8.68E-05	
	2026	On-Site Emissions	0.63	2.72E-03	1.71E-03	1.80E-03
		Truck Route	2.86	3.22E-05	9.21E-05	
					Max PM2.5	0.015

Maximum Exposed Individual Resident (MEIR) UTM coordinates: 565462.86 E, 4192290.84 N [(3)]

Total DPM concentrations used for Cancer Risk and Chronic Hazard calculations

[1] Model Output at the MEIR, based on unit emission rates for sources (1 g/s).

[2] From Emission Rate Calculations (Appendix A - Construction Emissions).

[3] In general, the MEIR location is the receptor location associated with the maximum predicted AERMOD concentrations from off-road equipment operating at the construction site (i.e., on-site emissions). The calculated emission rates from the off-road equipment (on-site emissions) are approximately 2 to 3 orders of magnitude higher than the calculated emission rates for off-site truck hauling (see Appendix A). Therefore, the maximum pollutant concentrations associated with the off-road equipment produce the highest overall pollutant concentrations at the MEIR and, consequently, highest calculated health risks.

Table C2
MEIR Health Risk Calculations

Source		MEIR Conc. ($\mu g/m^3$)	Weight Fraction	Contaminant	URF $(\mu g/m^3)^{-1}$	CPF $(mg/kg/day)^{-1}$	Dose (by age bin) 3rd Trimester (mg/kg-day)	Dose (by age bin) 0 < 2 years (mg/kg-day)	Dose (by age bin) 2 < 9 years (mg/kg-day)	Carcinogenic Risks (by age bin) 3rd Trimester per million	Carcinogenic Risks (by age bin) 0 < 2 years per million	Carcinogenic Risks (by age bin) 2 < 9 years per million	**Total Cancer Risk** per million	**Chronic Hazards [3]** REL ($\mu g/m^3$)	**Chronic Hazards [3]** RESP
(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
Residential Receptors - LRDP MM AIR-2.1															
2023	On & Off-Site Emissions	2.12E-03	1.0E+00	DPM	3.0E-04	1.1E+00	7.35E-07			3.96E-03			0.004	5.0E+00	4.24E-04
2024		1.82E-03					6.30E-07	1.90E-06		1.67E-02	1.92E-01		0.209		3.64E-04
2025		1.71E-03						1.79E-06			2.28E-01		0.228		3.42E-04
2026		1.84E-03						1.93E-06	1.52E-06		5.10E-02	2.64E-02	0.077		3.68E-04
												Total	**0.5**		**0.001**

Maximum Exposed Individual Resident (MEIR) UTM coordinates: 565462.86 E, 4192290.84 N

		3rd Trimester	0 < 2 years	2 < 9 years
	OEHHA age bin			
	exposure year(s)	2023	2023-2025	2025
Dose Exposure Factors:	exposure frequency (days/year)	350	350	350
	inhalation rate (L/kg-day) [1]	361	1090	861
	inhalation absorption factor	1	1	1
	conversion factor (mg/µg; m^3/L)	1.0E-06	1.0E-06	1.0E-06
Risk Calculation Factors:	age sensitivity factor	10	10	3
	averaging time (years)	70	70	70
	per million	1.0E+06	1.0E+06	1.0E+06
	fraction of time at home	0.85	0.85	0.72

exposure durations per age bin		exposure durations (year)		
Construction Year	Const Duration [2]	3rd Trimester	0 < 2 years	2 < 9 years
2023	0.04	0.04		
2024	1.00	0.21	0.79	
2025	1.00		1.00	
2026	0.74		0.21	0.54
Total	2.79	0.25	2.0	0.54

[1] Inhalation rate taken as the 95th percentile breathing rates (OEHHA, 2015).

[2] Construction durations determined for each year to adjust receptor exposures to the exposure durations for each construction year (see App A - Construction Emissions).

[3] Chronic Hazards for DPM using the chronic reference exposure level (REL) for the Respiratory Toxicological Endpoint.