

UC DAVIS
CORE 2 GREENHOUSE EXPANSION PROJECT

Tiered Initial Study and
Negative Declaration

The following Initial Study has been prepared in compliance with CEQA.

Prepared By:

CAMPUS PLANNING AND ENVIRONMENTAL STEWARDSHIP

**University of California
One Shields Avenue
436 Mrak Hall
Davis, California 95616**

November 2017

Contact: Matt Dulcich
Campus Planning and Environmental Stewardship
530-752-9597

TABLE OF CONTENTS

1	PROJECT INFORMATION	1
2	INTRODUCTION	3
2.1	Initial Study	3
2.2	Tiering Process	3
2.3	Public and Agency Review	4
2.4	Project Approvals	4
2.5	Organization of the Initial Study	5
3	PROJECT DESCRIPTION	7
3.1	Regional Location	7
3.2	Project Overview	7
3.3	Project Site	8
3.4	Project Need and Objectives	17
3.5	CORE 2 Project Elements	17
3.6	Orchard Park Greenhouses Demolition	17
3.7	Operations and Utilities	18
3.8	Construction and Demolition Schedule	22
4	CONSISTENCY WITH THE 2003 LRDP AND 2003 LRDP EIR	23
4.1	2003 LRDP Scope of Development	23
4.2	2003 LRDP Land Use Designation	23
4.3	2003 LRDP Population Projections	23
4.4	2003 LRDP Objectives	24
4.5	2003 LRDP EIR Cumulative Impacts Analyses	25
5	DETERMINATION	27
6	EVALUATION OF ENVIRONMENTAL IMPACTS	29
6.1	Aesthetics	29
6.2	Agricultural Resources	35
6.3	Air Quality	38
6.4	Biological Resources	47
6.5	Cultural Resources	58
6.6	Geology, Soils, and Seismicity	66
6.7	Greenhouse Gas Emissions	70
6.8	Hazards & Hazardous Materials	84
6.9	Hydrology & Water Quality	90

6.10	Land Use & Planning	101
6.11	Mineral Resources	108
6.12	Noise	109
6.13	Population & Housing	117
6.14	Public Services	119
6.15	Recreation	123
6.16	Transportation & Traffic	125
6.17	Utilities & Service Systems	131
6.18	Mandatory Findings of Significance	141
7	DEPARTMENT OF FISH & WILDLIFE DETERMINATION	143
8	REFERENCES	145
9	REPORT PREPARERS	149
9.1	UC Davis	149
9.2	Dudek	149

LIST OF APPENDICES

Appendix A. Proposed Negative Declaration

Appendix B. Air Quality and Greenhouse Gas Emissions Calculations

Appendix C. Noise Memorandum

LIST OF FIGURES

1	Regional Map	9
2	Vicinity Map	11
3	CORE 2 Site	13
4	Orchard Park Site	15
5	CORE 2 Site Plan	17
6	Site Photos	49
7	Existing LRDP Land Use	105
8	Noise Measurement Locations	111

LIST OF TABLES

4.5-1	2003 Lrdp Eir Population Projections Vs Actual	25
7-1	Estimated Construction Emissions	45
7-2.	Estimated Unmitigated Operational Emissions	45
7-3	Annual Ghg Emissions In California	71
7-4	Estimated Annual Construction Ghg Emissions	82
7-5	Estimated Annual Operational Greenhouse Gas Emissions	82
7-6	Existing Noise Environment	110
7-7	Thresholds Of Significance For Noise Evaluations	113

INTENTIONALLY LEFT BLANK

DAVIS CAMPUS

1 PROJECT INFORMATION

Project title:

CORE 2 Greenhouse Expansion Project

Project location:

University of California, Davis
Yolo County, California

Lead agency's name and address:

The Regents of the University of California
1111 Franklin Street
Oakland, California 94607

Contact person:

Matt Dulcich, Director of Environmental Planning
Campus Planning and Environmental Stewardship
medulcich@ucdavis.edu
530.752.9597

Project sponsor's name and address:

Campus Planning and Environmental Stewardship
University of California
One Shields Avenue
436 Mrak Hall
Davis, California 95616-8678

Location of administrative record:

See lead agency.

Identification of previous documents relied upon for tiering purposes:

This environmental analysis is tiered from the Environmental Impact Report (EIR) for the UC Davis 2003 Long Range Development Plan (2003 LRDP) (State Clearinghouse No. 2002102092). The 2003 LRDP is a comprehensive land use plan that guides physical development on campus to accommodate projected enrollment increases and expanded and new program initiatives. Section 2.2 provides additional information about the tiering process. The 2003 LRDP and its EIR are available for review at the following locations:

- UC Davis Campus Planning and Environmental Stewardship in 436 Mrak Hall on the UC Davis campus

- Reserves at Shields Library on the UC Davis campus
- Yolo County Public Library at 315 East 14th Street in Davis
- Online at: http://sustainability.ucdavis.edu/progress/commitment/environmental_review/index.html

Revisions to the Initial Study and Negative Declaration:

Minor changes to the Draft Initial Study and Negative Declaration, following public review, will be noted as shown.

Where changes have been made to the Initial Study and Negative Declaration, the format style of adding underline to indicate new text and strikethrough to indicate deletion of the prior text has been used as shown on the following example:

Example of text changes:

“This Initial Study ~~is being~~ was circulated for public and agency review from December 20, 2013 to January 20, 2014. Copies of this document, the 2003 LRDP, and the 2003 LRDP EIR ~~are~~ were made available for review at the following locations:”

2 INTRODUCTION

2.1 INITIAL STUDY

Pursuant to Section 15063 of the California Environmental Quality Act (CEQA) Guidelines (Title 14, California Code of Regulations, Sections 15000 et seq.), an Initial Study is a preliminary environmental analysis that is used by the lead agency as a basis for determining whether an EIR, a Mitigated Negative Declaration, or a Negative Declaration is required for a project. The CEQA Guidelines require that an Initial Study contain a project description, description of environmental setting, identification of environmental effects by checklist or other similar form, explanation of environmental effects, discussion of mitigation for significant environmental effects, evaluation of the project's consistency with existing, applicable land use controls, and the name of persons who prepared the study.

2.2 TIERING PROCESS

The CEQA concept of "tiering" refers to the evaluation of general environmental matters in a broad program-level EIR, with subsequent focused environmental documents for individual projects that implement the program. This environmental document incorporates by reference the discussions in the 2003 LRDP EIR (the Program EIR) and concentrates on project-specific issues. CEQA and the CEQA Guidelines encourage the use of tiered environmental documents to reduce delays and excessive paperwork in the environmental review process. This is accomplished in tiered documents by eliminating repetitive analyses of issues that were adequately addressed in the Program EIR and by incorporating those analyses by reference.

Section 15168(d) of the State CEQA Guidelines provides for simplifying the preparation of environmental documents on individual parts of the program by incorporating by reference analyses and discussions that apply to the program as a whole. Where an EIR has been prepared or certified for a program or plan, the environmental review for a later activity consistent with the program or plan should be limited to effects that were not analyzed as significant in the prior EIR or that are susceptible to substantial reduction or avoidance (CEQA Guidelines Section 15152[d]).

This Initial Study is tiered from the UC Davis 2003 LRDP EIR in accordance with Sections 15152 and 15168 of the CEQA Guidelines and Public Resources Code Section 21094. The 2003 LRDP EIR is a Program EIR that was prepared pursuant to Section 15168 of the CEQA Guidelines. The 2003 LRDP is a comprehensive land use plan that guides physical development on campus to accommodate projected enrollment increases and expanded and new program initiatives. The 2003 LRDP EIR analyzes full implementation of uses and physical development proposed under the 2003 LRDP, and it identifies measures to mitigate the significant adverse program-level and cumulative impacts associated with that growth. The CORE 2 Greenhouse Expansion Project (Project) is an element of the growth that was anticipated in the 2003 LRDP and evaluated in the 2003 LRDP EIR.

By tiering from the 2003 LRDP EIR, this Tiered Initial Study relies on the 2003 LRDP EIR for the following:

- a discussion of general background and setting information for environmental topic areas;
- overall growth-related issues;
- issues that were evaluated in sufficient detail in the 2003 LRDP EIR for which there is no significant new information or change in circumstances that would require further analysis; and
- assessment of cumulative impacts.

This Initial Study evaluates the potential environmental impacts of the Project with respect to the 2003 LRDP EIR to determine what level of additional environmental review, if any, is appropriate. As shown in the Determination in Section 6 of this document, and based on the analysis contained in this Initial Study, it has been determined that the Project would not result in any potentially significant impacts that cannot be mitigated to less than significant levels or that were not adequately addressed by the 2003 LRDP EIR. Therefore, the preparation of a Negative Declaration is appropriate (the Proposed Negative Declaration is presented in **Appendix A**).

This Initial Study concludes that the Project impacts are addressed by the measures adopted as part of the 2003 LRDP approval. Therefore, those 2003 LRDP EIR mitigation measures that apply to the Project, and are required in order to avoid or substantially reduce a potentially significant impact, are identified in this Initial Study. Nothing in this Initial Study in any way alters the obligations of the campus to implement the LRDP mitigation measures.

2.3 PUBLIC AND AGENCY REVIEW

This Initial Study is being circulated for public and agency review from November 3, 2017 to December 4, 2017. Copies of this document, the 2003 LRDP, and the 2003 LRDP EIR are available for review at the following locations:

- UC Davis Campus Planning and Environmental Stewardship in 436 Mrak Hall on the UC Davis campus
- Reserves at Shields Library on the UC Davis campus
- Yolo County Public Library at 315 East 14th Street in Davis
- Online at http://sustainability.ucdavis.edu/progress/commitment/environmental_review/index.html

Comments on this Initial Study must be received by 5:00 PM on December 4, 2017 and can be emailed to medulcich@ucdavis.edu or sent to:

Matt Dulcich
Campus Planning and Environmental Stewardship
University of California
One Shields Avenue
436 Mrak Hall
Davis, California 95616

2.4 PROJECT APPROVALS

As a State entity principally responsible for approving or carrying out the Project, the University of California is the Lead Agency under CEQA and is responsible for reviewing and certifying the adequacy of the environmental document and approving the Project. Design approval for the first phase of the Project (including demolition and construction) will be considered by the UC Davis Chancellor in Fall 2017. As other phases of the Project will be implemented over the 10 years, subsequent approvals for demolition and construction will be considered by the UC Davis Chancellor over that time period.

As the Project would disturb more than one acre of land, the University or its contractor would apply to the State Water Resources Control Board (SWRCB) for coverage under the National Pollution Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction

and Land Disturbance Activities (further described in Section 7.9.4). The site demolition may also be subject to review by Yolo Solano Air Quality Management District.

2.5 ORGANIZATION OF THE INITIAL STUDY

This Initial Study is organized into the following sections:

Section 1 – Project Information: provides summary background information about the Project, including project location, lead agency, and contact information.

Section 2 – Introduction: summarizes the Initial Study's relationship to the 2003 LRDP EIR, the scope of the document, the Project's review and approval processes, and the document's organization.

Section 3 – Project Description: includes a description of the Project, including the need for the Project, the Project's objectives, and the elements included in the Project.

Section 4 – Consistency with the 2003 LRDP: describes the consistency of the Project with the 2003 LRDP and 2003 LRDP EIR.

Section 5 – Environmental Factors Potentially Affected: identifies which environmental factors, if any, involve at least one significant or potentially significant impact that has not been previously addressed in the 2003 LRDP EIR and cannot be reduced to a less than significant level.

Section 6 – Determination: indicates whether impacts associated with the Project are significant, and what, if any, additional environmental documentation is required.

Section 7 – Evaluation of Environmental Impacts: contains the Environmental Checklist form for each resource area. The checklist is used to assist in evaluating the potential environmental impacts of the Project with respect to the 2003 LRDP EIR. This section also presents a background summary for each resource area, the standards of significance, relevant impacts and mitigation measures from the 2003 LRDP EIR, and an explanation of all checklist answers.

Section 8 – Fish and Game Determination: indicates if the Project has a potential to impact wildlife or habitat and if an associated Fish and Game filing fee would be paid.

Section 9 – References: lists references used in the preparation of this document. Includes the names of individuals contacted in preparation of this document.

Section 10 – Report Preparers: lists the names of individuals involved in the preparation of this document.

Appendix A – Proposed Negative Declaration: presents the Proposed Negative Declaration for the Project.

Appendix B – Air Quality and Greenhouse Gas Emissions Calculations: presents the calculations conducted for the Project.

Appendix C – Noise Memorandum: presents the ambient noise measurements and noise analysis for the Project.

INTENTIONALLY LEFT BLANK

3 PROJECT DESCRIPTION

3.1 REGIONAL LOCATION

The approximately 5,300 acre UC Davis campus is located in Yolo and Solano Counties approximately 72 miles northeast of San Francisco, 15 miles west of the City of Sacramento, and adjacent to the City of Davis (see **Figure 1, UC Davis Location**). The campus is composed of four campus units: the central campus, the south campus, the west campus, and Russell Ranch. Most academic and extracurricular activities occur within the central campus. The central campus is bounded generally by Russell Boulevard to the north, State Route 113 (SR 113) to the west, Interstate 80 (I-80) and the Union Pacific Railroad tracks to the south, and A Street to the east. The south campus is located south of I-80 and north of the South Fork of Putah Creek. The west campus is bounded by SR 113 to the east, Putah Creek to the south, Russell Boulevard to the north, and extends approximately one-half mile west of County Road 98. The south and west campus units are contiguous with the central campus, and are used primarily for field teaching and research. The approximately 1,600 acre Russell Ranch portion of the campus lies to the west, separated from the west campus by approximately one and one-half miles of privately owned agricultural land. Russell Ranch was purchased in 1990 for campus uses including large-scale agricultural and environmental research, study of sustainable agricultural practices, and habitat mitigation. Russell Ranch is bordered roughly by County Road 96 on the east, Putah Creek on the south, Covell Boulevard on the north, and Russell Boulevard and privately owned agricultural land on the west and northwest.

The CORE 2 Greenhouse Expansion Project (“Project”) site is located within the UC Davis central campus, west of La Rue Road, between Extension Center Drive and Hutchison Drive (see **Figure 2, Project Location**). The Core 2 site is located immediately east of the existing CORE Greenhouse complex. The Project also encompasses the phased demolition of the Orchard Park Greenhouses. The Orchard Park Greenhouses site is located west of La Rue Road, at the southeastern corner of Orchard Park Road and Orchard Road (see Figure 2, Project Location).

3.2 PROJECT OVERVIEW

UC Davis proposes to construct additional teaching and research greenhouses on approximately 5 acres at the CORE 2 site north of Hutchison Drive and east of State Route 113 on the central campus at UC Davis. These greenhouse buildings at UC Davis are proposed for teaching and research purposes in the areas of plant growth, plant breeding, and related plant experiments. As new greenhouses are constructed in phases, existing greenhouses totaling approximately 53,250 square feet on 7.8 acres at the Orchard Park Greenhouses site would gradually be removed.

The CORE 2 Greenhouse Expansion at the CORE 2 site includes three components:

- The Cacao Germplasm Greenhouses (approximately 20,826 square feet of greenhouse space on 0.75 acres);
- Phase 1 Greenhouses Expansion (approximately 10,800 square feet of greenhouse space on 0.93 acres); and
- Future Expansion Area (approximately 34,800 square feet of greenhouse space on 2.68 acres).

The CORE 2 site would include a headhouse¹, a service yard, utilities, limited parking, access roads, a soil area, and a stormwater detention pond. The project phasing at the Core 2 site is expected to occur over a ten-year period. At a future date, the Orchard Park Greenhouses site could eventually be redeveloped and an appropriate CEQA review would be conducted to evaluate the environmental effects of such a future project.

3.3 PROJECT SITE

The CORE 2 Project site is located within the UC Davis central campus, west of La Rue Road, between Extension Center Drive and Hutchison Drive (see **Figure 3, CORE 2 Greenhouse Site**). The Project site is located west of the CORE Greenhouses, between Hutchison Drive and SR 113. The land uses surrounding the Project site include the following:

- **North:** Research fields and Extension Center Drive.
- **East:** The CORE Greenhouse complex and the Bowley Plant Science Teaching Facility, consisting of 21 greenhouses, two headhouses, and the Bowley Center.
- **South:** Hutchinson Drive is adjacent to the Project site, and the Health Sciences District is located on the other side of the roadway.
- **West:** West of the Future Expansion Area is an agricultural teaching field, which would remain, although a portion would become a soils storage area for the greenhouses. SR 113 forms a boundary to the west.

The 2003 LRDP land use designation for the CORE 2 Project site is primarily *Academic/Administrative Low Density* with the westernmost portion of the Project site designated as *Teaching and Research Open Space*.

The Orchard Park Greenhouses site is located southeast of Orchard Park Road and Orchard Road (see **Figure 4, Orchard Park Greenhouses**). The Orchard Park Greenhouses site is primarily surrounded by student housing and services. The land uses surrounding the site include the following:

- **North:** Three administrative buildings, including the Human Resources building are located between the Project site and Orchard Road. North of Orchard Road are the Russell Park Apartments, and to the northwest, the vacant Orchard Park Apartments.
- **East:** The Student Health and Wellness Center and Parking Lot #35 are located east of the site.
- **South:** Student apartments, the Colleges at La Rue, are located south of the site.
- **West:** The Domes, a cooperative student housing complex, and the Agriculture Field Station, which includes experimental gardens, are to the west.

The 2003 LRDP land use designation for the Orchard Park Greenhouses site is *Student Housing*.

¹¹ The headhouse is a building that acts as a work center for a group of greenhouses. It may include office space, restrooms, potting space, storage areas, and utility controls.

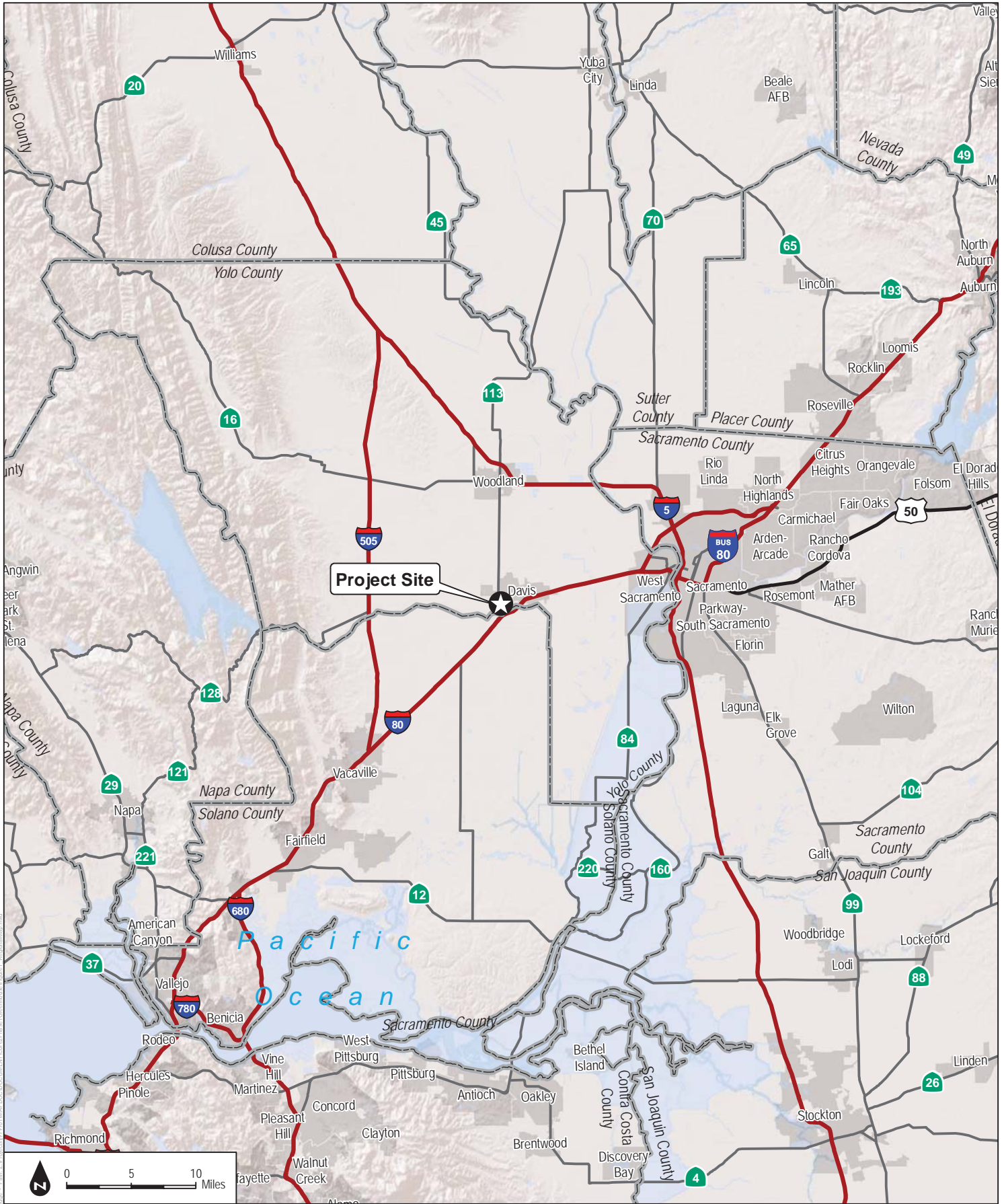


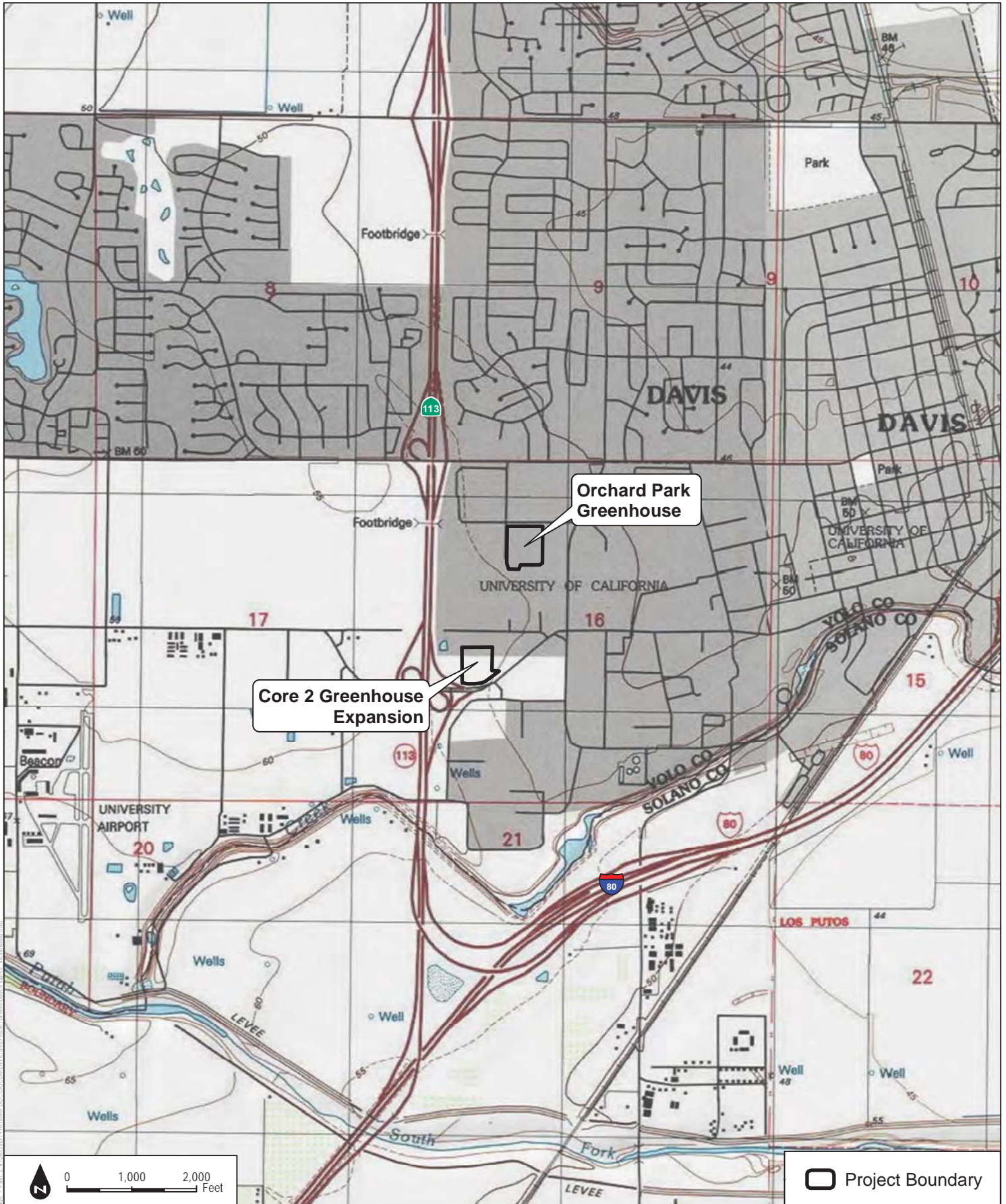
FIGURE 1
Regional Map



UC Davis Greenhouse Project

11/15/2017 11:58:00 AM \\MAPS\PROJECTS\UCDavisGreenhouse\11152017_115800AM.mxd

INTENTIONALLY LEFT BLANK



SOURCE: USGS 7.5-Minute Series Merritt Quadrangle
Township 8N, Range 2E, Section 16

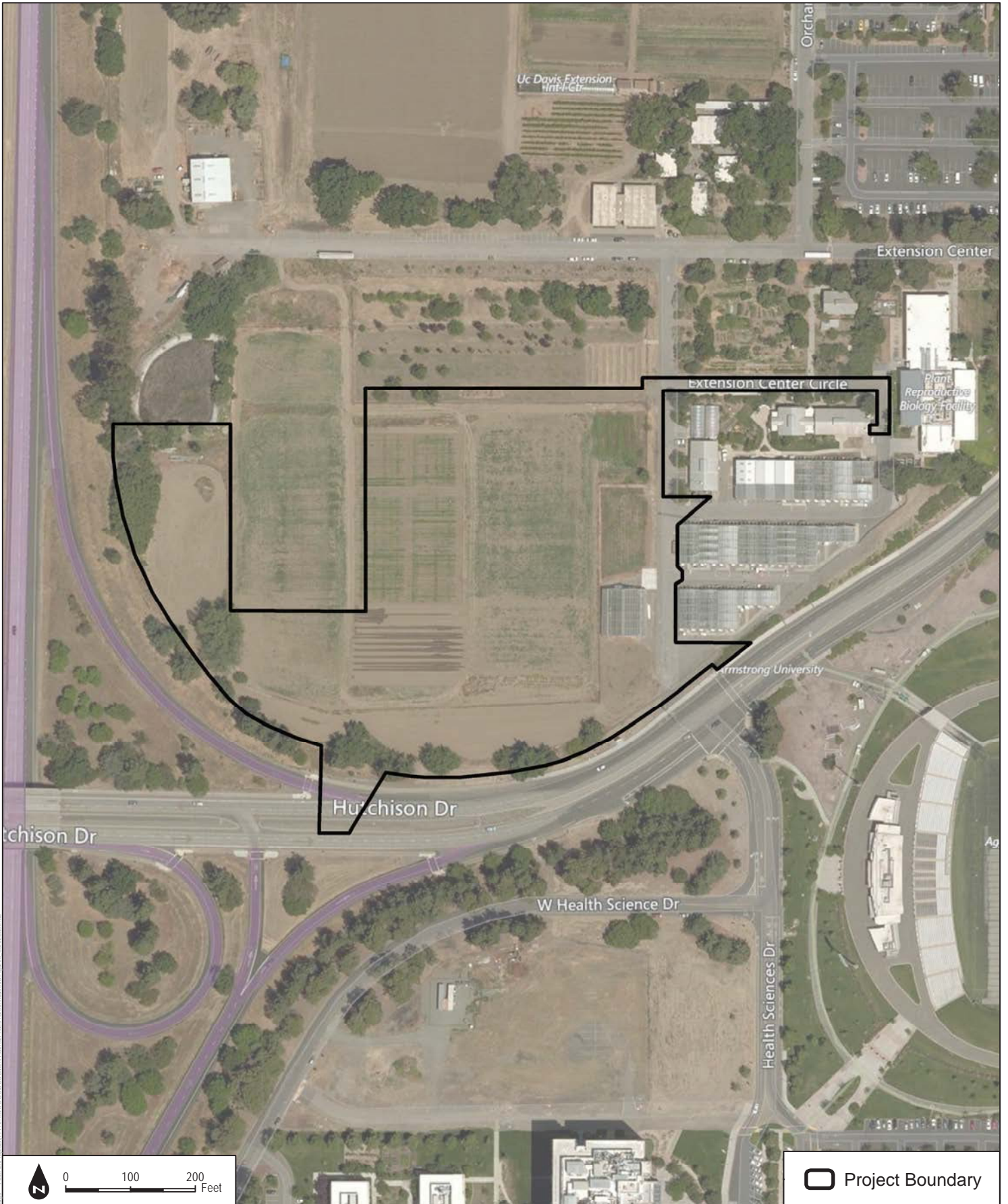
FIGURE 2
Vicinity Map

DUDEK

UC Davis Greenhouse Project

FILE: 5/20/2017 - 1:18:54 PM \\MAPS\PROJECTS\UC Davis Greenhouse Project\Map\Map.dwg

INTENTIONALLY LEFT BLANK



File: 57220117 - List saved by: esteban@duke.edu - Print: 2/2/2017 10:00:00 AM - UC Davis Greenhouse Project - Figure 3 - Core 2 Site Map

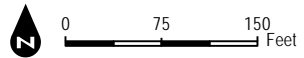


SOURCE: Bing Maps (Accessed 2017)

UC Davis Greenhouse Project

FIGURE 3
Core 2 Greenhouse Site Map

INTENTIONALLY LEFT BLANK



 Project Boundary

INTENTIONALLY LEFT BLANK

3.4 PROJECT NEED AND OBJECTIVES

Greenhouses are an important research and teaching facility for the College of Agriculture and Environmental Sciences. The Project objectives are:

- Provide for the orderly expansion of modern greenhouse space within the campus.
- Locate new greenhouses near existing agricultural facilities and fields.
- To provide replacement greenhouses with improved energy efficiency, modern environmental control mechanisms, and decreased maintenance costs.
- Locate new greenhouses with nearby access to faculty office, laboratory, and teaching locations in the core campus.

3.5 CORE 2 PROJECT ELEMENTS

The CORE 2 project includes the Cacao Germplasm Greenhouses, the Phase 1 Greenhouses, and a Future Expansion Area (see **Figure 5, CORE 2 Site Plan**). Shared access roads and parking, utilities, a detention basin, and a soils area would support these facilities.

3.5.1 Cacao Germplasm Greenhouses

The proposed new Cacao Germplasm Greenhouses would house a collection of cacao plants to provide plant stock for breeding and research purposes and also to serve as a catalog and repository for cacao varieties. The Project would include two rectangular structures (approximately 10,000 square feet [sf] each), polycarbonate panels (siding), insect screens, environmental conditioning (mistifiers and fans), radiant fin heating, shade screens, an automated control system (for climate, irrigation, and nutrients), a security alarm/card reader, and LED lighting. These structures would also include concrete slabs with drainage and plumbing.

3.5.2 CORE 2 Phase 1 Greenhouses

The CORE 2 Phase 1 Greenhouses would be located south of the Cacao Germplasm Greenhouses, adjacent to the existing Tall Corn Greenhouse. The Phase 1 Greenhouses would consist of an initial group of three greenhouses (1,200 sf each), to be followed by an additional 4 to 6 greenhouses (1,200 sf each). These would be research greenhouses. The Phase 1 Greenhouses would have a support area including a utility building (boiler, electrical, etc.). The soils area to support the greenhouses would be constructed in Phase 1, and would be expanded as needed to serve the Future Expansion area of the CORE 2 site.

3.5.3 Future Expansion

This conceptually defined area to the west of Phase 1 would consist of approximately 25 to 30 additional greenhouses of 1,200 sf each and support facilities. These greenhouses are currently slated for research purposes; however, some could be used for teaching. The Future Expansion area would include a new headhouse and a service yard for equipment storage, soil storage, and autoclaves.

3.6 ORCHARD PARK GREENHOUSES DEMOLITION

The existing greenhouses at the Orchard Park site would be demolished in phases. As new greenhouses are constructed at the CORE 2 site, Orchard Park Greenhouses would be demolished, typically in groups of four. This would allow the University to maintain an adequate supply of greenhouse space. Demolition of each phase would occur over a three-week period, and would include removal of all furnishings and

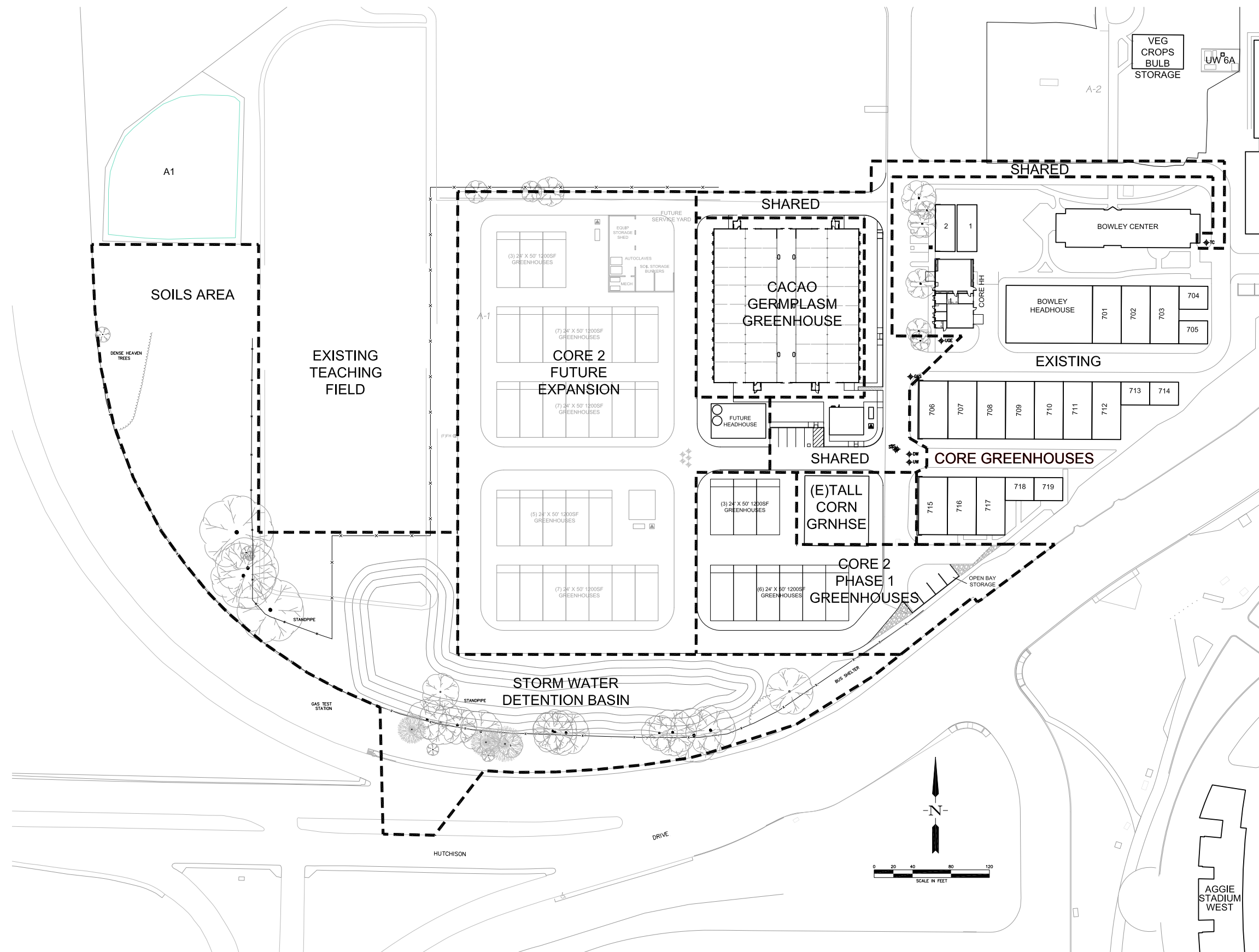
equipment, disconnection of utilities, demolition of the structure, and regrading of the site. The structural materials, such as metal and glass, would be recycled to the maximum extent feasible.

3.7 OPERATIONS AND UTILITIES

3.7.1 Building Features

The proposed CORE 2 site greenhouses would be aluminum-framed structures built on a cement slab. The Cacao Germplasm Greenhouses would be paneled with Lexan twin walled polycarbonate panels. These plastic panels have an R-value of 1.7, almost twice as efficient as single pane glass. Other greenhouses would be paneled with similar materials. The greenhouses would be equipped with radiant heating, misters and fans, supplemental lighting, environmental controls and security alarms/access controls.

The supplemental lighting for the new greenhouses would be used up to 16 hours in the winter and up to 8 hours in the summer (4 hours in the morning and 4 in the evening). The existing greenhouses on the CORE site utilize HPS (high pressure sodium) lighting. The Cacao Germplasm Greenhouses would use LED lighting. Lighting for other CORE 2 greenhouses would either be LED or energy efficient HPS.



SOURCE: UC Davis (2017)

DUDEK

UC Davis Greenhouse Project

FIGURE 5
Core 2 Greenhouse Site Plan

INTENTIONALLY LEFT BLANK

3.7.2 Utilities and Infrastructure

The proposed CORE 2 greenhouses would be served by water, sewer, storm drain, natural gas, electricity, and telecommunications.

Water service would consist of separate connections for domestic/fire supply and utility water. Utility water includes irrigation and the Project would connect to this service via an existing 10-inch main along the existing driveway on the east side of the CORE 2 site. Domestic and fire protection service lines would connect to the existing 8-inch main that is also located along the existing driveway. Services to the greenhouses (and support buildings) shall be extended with adequate approved protections (i.e.: double check valves assembly, reduced pressure backflow protections, etc.). The firewater final layout and any required hydrant locations would require UCD Fire Department's approval. The proposed utility water connection shall be at existing 10-inch main along the existing driveway on the east side of the CORE 2 site.

The CORE 2 site is currently served by the existing Campus sewer system. The proposed point of connection for the Project is the existing manhole (SSMH3-45NW) along the existing driveway on the northeast side of the CORE 2 site.

Storm water from the site would be directed via new drain lines and swales to a proposed detention basin at the southern edge of the CORE 2 site. Water in the detention basin would be discharged at a controlled flow rate into the Campus storm drain system. The proposed point of connection would be the existing storm manhole (SDMH2-52SW) in Hutchison Drive on the southwest side of the CORE 2 site. The timing of the detention basin construction would likely be during Phase 1. An alternative location for the detention basin is also being considered in this Initial Study and would be located in the northwest corner of the Future Expansion area. If such a site is pursued, it could result in a reduction in the number of greenhouses that could be sited in this area. The proposed point of connection with the Campus storm drain system would be located in Hutchison Drive.

Electricity is currently provided by the Campus. The proposed point of connection would be at the existing manhole along the existing driveway on the east side of the CORE 2 site, which would connect to the Bowley Center 12KV building loop. The 12KV electrical services would be extended to the CORE 2 site.

The Project would use centralized hydronic heating for space heating in addition to heating from gas boilers. The proposed point of connection would be at an existing 3-inch gas main line also along the existing driveway.

Telecommunications would be provided by the campus. The proposed point of connection would be the existing building distribution frame at the Bowley Plant Science Teaching Facility.

3.7.3 Sustainability

The University develops projects consistent with the UC Policy on Sustainable Practices (UC Regents 2016) and campus goals. The Sustainable Practices policy includes an objective for new construction to use 20% less energy as compared to current California Building Code (CBC) Title 24 energy efficiency standards, and to achieve a LEED-NC designation of Silver or higher. In addition, UC Davis policy targets a 25% reduction in energy relative to Title 24 standards. However, due to the unique nature of greenhouse projects, LEED certification will not be obtained, and normal Title 24 targets cannot be applied. Therefore, the project includes the following environmental characteristics:

- Shade curtains reduce heat gain during the day
- Perimeter radiant fin heating with advanced controls for optimal efficiency

- High Solar Reflective Index materials on site to reduce solar heat gain
- Storm water detention basin for 100 year event

3.7.4 Access and Parking

The CORE 2 site would include access roads, connected to the existing CORE driveway. The roadways would ultimately be paved; however, due to limited funding availability each fiscal year, some roads would remain as gravel roads until funding is identified and future phases are initiated. Limited parking, approximately five spaces, would be located between the Cacao Germplasm area and the Phase 1 area. The parking would include at least one accessible spot. Dedicated bicycle parking may be added with the Future Expansion phases.

3.7.5 Staff

Approximately 10 part-time greenhouse staff would support the CORE 2 site, in addition to researchers and students who would access the greenhouses.

3.7.6 Pesticide Use

Pesticides are currently stored in the pesticide storage room located at the CORE headhouse adjacent to the CORE 2 site. Pesticide use and storage are regulated by the California Department of Pesticide Regulation. All containers are disposed of via the Chemical Waste pick-up system. All containers are triple rinsed and punched out before disposal. The existing storage room is large enough to service the CORE 2 Phase 1 Greenhouses. The Future Expansion Area would include a similarly sized pesticide storage/mixing area as part of a new headhouse.

3.8 CONSTRUCTION AND DEMOLITION SCHEDULE

Construction on the CORE 2 site is anticipated to begin in Fall 2017. The estimated construction period would be 7 months. Following construction of the first CORE 2 Phase 1 Greenhouses, demolition would begin at the Orchard Park Greenhouses site. Demolition would occur in phases tied to the completion of new greenhouses at the CORE 2 site. Typically, four greenhouses would be demolished at one time, which would take approximately three weeks. Overall, completion of all phases of construction at the CORE 2 site and the final demolition of the Orchard Park Greenhouses Site would occur over a period of 10 years.

4 CONSISTENCY WITH THE 2003 LRDP AND 2003 LRDP EIR

In order to determine the Project's consistency with the 2003 LRDP and 2003 LRDP EIR, the following questions must be answered:

- Is the Project included in the scope of the development projected in the 2003 LRDP?
- Is the proposed location of the Project in an area designated for this type of use in the 2003 LRDP?
- Are the changes to campus population associated with the Project included within the scope of the 2003 LRDP's population projections?
- Are the objectives of the Project consistent with the objectives adopted for the 2003 LRDP?
- Is the Project within the scope of the cumulative analysis in the 2003 LRDP EIR?

4.1 2003 LRDP SCOPE OF DEVELOPMENT

The 2003 LRDP also planned for the development of 4.2 million gross square feet of academic and administrative space on the campus over 2001-2002 levels. This development was expected to occur primarily as infill within the central campus' academic core and Health Sciences District. The proposed project would add 65,360 square feet of greenhouse space and would remove 53,250 square feet for a net addition of approximately 12,110 square feet. The proposed additional square feet of space and the greenhouse activities are within the scope of development proposed under the 2003 LRDP.

4.2 2003 LRDP LAND USE DESIGNATION

As discussed in Section 3.3 above, the CORE 2 Project site is designated primarily as *Academic/Administrative High Density* in the 2003 LRDP, with the westernmost portion of the site being designated as *Teaching and Research Fields*. The *Academic/Administrative High Density* land use describes areas that support the teaching, research, and public service uses and that often contain large, multi-story facilities. This includes classrooms, research laboratories and research support areas, faculty, student and staff offices, libraries, program support facilities, student activity space, meeting rooms, space for public service, outreach and cultural activities, and business/service activities that support the University mission. The *Teaching and Research Fields* designation describes lands for teaching, research, and support of academic programs primarily in the plant and animal sciences. These areas typically do not contain large buildings but could include agricultural-related buildings and facilities on sites smaller than two acres. As greenhouses and associated structures associated with the proposed Project would support research uses, the Project would comply with the CORE 2 Project site's land use designation as identified in the 2003 LRDP.

The Orchard Park Greenhouses site is currently designated as *Student Housing* by the 2003 LRDP. This land use describes areas that include student housing and campus childcare centers. The proposed project would remove the existing greenhouses on the project site and leave the site vacant for a potential future redevelopment project. Administering the site in a vacant state would include weed control with no anticipated active uses, improvements, or activities. As a vacant site, the project would further the goals of the 2003 LRDP by making the site available for implementation of uses that are consistent with the 2003 LRDP land use designation

4.3 2003 LRDP POPULATION PROJECTIONS

The 2003 LRDP projected that the 2015-2016 academic year on-campus population would increase to approximately 30,000 students and 16,900 employees (approximately 14,500 faculty and 2,400 non-UC

employees).² The actual 2015-2016 campus population was 32,663 students and 12,181 employees (UC Davis 2016b). While the student population projection of 30,000 has been slightly exceeded, the projection for total campus population remains accurate with the daily population on the campus being approximately 3,000 people less than previously projected. The Project would not increase student enrollment, but would support existing and future students. The new CORE 2 greenhouses that would be constructed by the Project would require support by 10 staff. These employees would likely be staff that were previously working at the Orchard Park Greenhouses site or students that are currently part of the campus population. Even with the conservative assumption that all staff are new, staff levels with the Project are well below the 2003 LRDP projections. Therefore, the Project would not exceed the on-campus staffing levels planned for in the LRDP.

4.4 2003 LRDP OBJECTIVES

The primary objective of the 2003 LRDP is to plan for the Davis campus' share of the University of California's short- and long- term enrollment demands. In addition, the 2003 LRDP aims to:

- create a physical planning framework to support the teaching, research, and public service mission of the campus;
- manage campus lands and resources in a spirit of stewardship for the future; and
- provide an environment that enriches campus life and serves the greater community.

The Project would support these main objectives of the 2003 LRDP by removing uses on the Orchard Park Greenhouses site that are inconsistent with the site's land use designation in the 2003 LRDP and by constructing greenhouses and accompanying facilities on the CORE 2 site that would support research resources in the University's central campus.

In addition, the 2003 LRDP includes specific objectives that are relevant to the Project, including the following:

Field Teaching: Maintain field teaching centers for the plant sciences (Plant Science Teaching Facility and Student Experimental Farm) and animal sciences (Cole Facility and Animal Exposition Center) within the boundaries of the Central Campus to provide easy student access.

- The Project would construct greenhouses within the central campus that would support teaching and research in the plant sciences.

New Sites in Central Campus: Expand sites in the Orchard Park area for additional housing sites in the Central Campus. These include the current site of the Orchard Park Green Housing, the west and north edges of Orchard Park family housing, and at the Tercero complex.

- The Project would help support the housing needs of the growing student population by making additional land available for Student Housing on the Orchard Park Greenhouses site.

² The on-campus population includes students and employees on the UC Davis main campus and at other University owned and operated facilities in the City of Davis. The campus population is determined based on headcount, a method of counting faculty, staff, and students in which each person is counted as one unit regardless of whether he or she is employed or studying full-time or part-time. Student population figures represent student headcount averaged over the primary three academic quarters (i.e., fall, winter, spring). <http://budget.ucdavis.edu/data-reports/enrollment-reports.html>

4.5 2003 LRDP EIR CUMULATIVE IMPACTS ANALYSES

In addition to evaluating the environmental effects directly associated with projected campus development, the 2003 LRDP EIR evaluates the cumulative effects of campus development combined with off-campus development. The cumulative context considered in the 2003 LRDP EIR varies, depending on the nature of the issue being studied, to best assess each issue’s geographic extent. For example, the cumulative impacts on water and air quality can be best analyzed within the boundaries of the affected resources, such as water bodies and air basins. For other cumulative impacts, such as hazard risks, traffic, and the need for new public service facilities, the cumulative impact is best analyzed within the context of the population growth and associated development that are expected to occur in the region.

As discussed in Sections 4.1 through 4.4 above, the Project is within the scope of campus development projected in the 2003 LRDP EIR. However, it is now 2017 and the proposed Project would be implemented post-2017, which is beyond the timeframe considered in the cumulative analysis for the 2003 LRDP EIR (2015-2016). Therefore, UC Davis has evaluated the status of growth and development in the region as of 2016 (last complete data year) in comparison to the local growth projections considered in the 2003 LRDP EIR to determine whether actual growth differs from the projections and whether such a difference could substantially change the 2003 LRDP EIR conclusions regarding cumulative impacts. Within each environmental impact discussion (Section 7), the lead agency considers the potential for the proposed Project to contribute to cumulative impacts and whether this project’s contribution would exceed the cumulative impact determinations identified in the 2003 LRDP EIR.

The 2003 LRDP EIR looked at regional growth in the context of the cities of Davis, Dixon, Winters, and Woodland as well as in the context of Yolo and Solano Counties. Table 4.11-5 of the 2003 LRDP EIR presented the anticipated population and housing growth through 2015. Those projections have been compared to the actual populations for these jurisdictions in Table 4-1, below. Growth in the region has been lower than anticipated for all jurisdictions except the City of Davis, which grew by 1,074 persons (or 0.016 percent) more than anticipated.

**Table 4.5-1
2003 LRDP EIR Population Projections vs Actual**

Jurisdiction	LRDP EIR Projected 2015	Actual 2015	Difference
City of Davis	67,240	68,314	1,074
City of Winters	10,610	7,214	-3,396
City of Woodland	60,415	57,526	-2,889
Yolo County	227,130	214,555	-12,575
City of Dixon	24,300	19,018	-5,282
Solano County	512,000	431,498	-80,502
Sacramento County	1,574,420	1,495,297	-79,123
Three-County Total	2,313,550	2,141,350	-172,200

Source: UC Davis 2003: Table 4.11-5. California Department of Finance 2016.

ENVIRONMENTAL RESOURCES POTENTIALLY AFFECTED

The environmental resources, if checked below, would be potentially affected by this Project and would involve at least one impact that is a significant or potentially significant impact that has not been previously addressed in the 2003 LRDP EIR and cannot be reduced to a less than significant level as indicated by the checklist on the following pages.

- | | | |
|--|---|--|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agricultural Resources | <input type="checkbox"/> Air Quality |
| <input type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources | <input type="checkbox"/> Geology, Soils & Seismicity |
| <input type="checkbox"/> Hazards & Hazardous Materials | <input type="checkbox"/> Hydrology & Water Quality | <input type="checkbox"/> Land Use & Planning |
| <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Noise | <input type="checkbox"/> Population & Housing |
| <input type="checkbox"/> Public Services | <input type="checkbox"/> Recreation | <input type="checkbox"/> Transportation & Traffic |
| <input type="checkbox"/> Utilities & Service Systems | <input type="checkbox"/> Mandatory Findings of Significance | |

As indicated in the checklist above and based on the analysis presented in this Initial Study, it has been determined that for all resource areas, the Project would not result in any significant impacts that cannot be mitigated to a less than significant level or are not adequately addressed by the 2003 LRDP EIR. This Initial Study has concluded that the Project would incrementally contribute to, but would not exceed, certain significant cumulative impacts previously identified in the 2003 LRDP EIR, and that for such impacts, no new mitigation measures, other than those previously identified in the 2003 LRDP EIR have been identified to further reduce the impact. The Project would not require any project-specific mitigation measures and completion of a Negative Declaration is therefore appropriate. The proposed Negative Declaration is included in **Appendix A**.

5 DETERMINATION

On the basis of this initial evaluation:

- The Project **COULD NOT** have a significant effect on the environment that has not been previously addressed in the 2003 LRDP EIR, and no new mitigation measures, other than those previously identified in the 2003 LRDP EIR, are required. A **NEGATIVE DECLARATION** will be prepared. The draft **NEGATIVE DECLARATION** is included in Appendix A.
- The Project **COULD** have a significant effect on the environment, the Project impacts were adequately addressed in an earlier document or there will not be a significant effect in this case because revisions in the Project have been made that will avoid or reduce any potential significant effect to a less than significant level. A **MITIGATED NEGATIVE DECLARATION** will be prepared.
- The Project **MAY** have a potentially significant effect on the environment that was not previously addressed in the 2003 LRDP EIR. A **TIERED ENVIRONMENTAL IMPACT REPORT** will be prepared to address new impacts not previously identified in the 2003 LRDP EIR.

Matt Dulcich, AICP

Director of Environmental Planning

Date

INTENTIONALLY LEFT BLANK

6 EVALUATION OF ENVIRONMENTAL IMPACTS

Introduction

The University has defined the column headings in the Initial Study as follows:

- **Potentially Significant Impact:** This column is checked if there is substantial evidence that the Project’s effect may be significant. If the Project may result in one or more Potentially Significant Impacts, an EIR is required.
- **Less than Significant with Project-level Mitigation Incorporated:** This column is checked where incorporation of project-specific mitigation measures will reduce an effect from “Potentially Significant Impact” to “Less than Significant Impact.” All project-level mitigation measures must be described, including a brief explanation of how the measures reduce the effect to a less than significant level.
- **Project Impact Addressed in the 2003 LRDP EIR:** This column is checked where the potential impacts of the Project were adequately addressed in the 2003 LRDP EIR and mitigation measures identified in the LRDP EIR will mitigate any impacts of the Project to the extent feasible. All applicable LRDP EIR mitigation measures are incorporated into the Project as proposed. The impact analysis in this document summarizes and cross references (including section/page numbers) the relevant analysis in the LRDP EIR.
- **Less than Significant Impact:** This column is checked when the Project will not result in any significant effects. The effects may or may not have been discussed in the LRDP EIR. The project impact is less than significant without incorporation of LRDP or project-level mitigation.
- **No Impact:** This column is checked when a project would not result in any impact in the category or the category does not apply. “No impact” answers need to be adequately supported by the information sources cited or should note that the impact does not apply to projects like the one involved (e.g., the Project outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the Project will not expose sensitive receptors to pollutants, based on project specific screening analysis.)

6.1 AESTHETICS

6.1.1 Background

Section 4.1 of the 2003 LRDP EIR addresses the aesthetics effects of campus growth under the 2003 LRDP. The following discussion summarizes information presented in the ‘Setting’ subsection of Section 4.1 of the 2003 LRDP EIR.

Environmental Setting

The campus is surrounded by extensive agricultural uses to the west and south, and by residential, institutional, and commercial land uses in the City of Davis to the north and east. Views within the Davis area are generally of two types: open views of agricultural land and supporting facilities with views of hills to the west, and views of developed areas within UC Davis and the City of Davis.

UC Davis consists of four geographic units that have distinct visual character: the central campus, the south campus, the west campus, and Russell Ranch. The Project sites are located within the central campus, which is the most developed area of campus and is characterized by varied architectural styles, large trees, and formal landscaping. The west and south campus units and Russell Ranch primarily include teaching and research fields with agricultural buildings (although the west and

south campus units also include more developed areas, including campus support, academic, residential and administrative facilities).

The 2003 LRDP identifies the following as valued visual elements of the central campus: the large, open lawn of the Quad at the heart of the campus; the framework of tree-lined streets, particularly around the Quad where the street tree branches arch to create a canopy overhead; the Arboretum, with its large trees and variety of landscapes along the waterway; the shingle-sided buildings from the founding years of the University Farm; buildings from the second era of campus development such as Hart Hall and Walker Hall; green open spaces that face the community along Russell Boulevard and A Street; bicycles as a distinct and valued visual emblem on campus; and the South Entry area, including the new entrance quad and the Robert and Margrit Mondavi Center for the Performing Arts.

Design review of campus development projects takes place during the project planning, design, review, and approval processes to sustain valued elements of the campus' visual environment, to assure new projects contribute to a connected and cohesive campus environment, and to otherwise minimize adverse aesthetics effects as feasible. Formal design review by the campus Design Review Committee takes place for every major capital project. This Committee includes standing members from the Offices of Resource Management and Planning, Design and Construction Management, Grounds, and other departments concerned with potential aesthetic effects, as well as program representatives and invited design professionals with expertise relevant to the project type. Campus design standards and plans that provide the basis for design review include the 2003 LRDP, the UC Davis Physical Design Framework, the Campus Standards and Design Guide manual, the Campus Architectural Design Guidelines, and the Campus Core Study.

Project Site

The CORE 2 Project site is located within the UC Davis central campus, and is within a developed area containing research fields, Extension Center Drive, the CORE greenhouse complex and Bowley Plant Sciences Teaching Facility, Hutchinson Drive, and an agricultural teaching field. The Core 2 Project site contains agricultural research/teaching fields and the existing Tall Corn greenhouse building. The Orchard Park Greenhouses site is located southeast of Orchard Park Road and Orchard Road in a developed area surrounded by student housing and services. The Orchard Park Greenhouses site contains greenhouses and support structures.

Public views of the CORE 2 Project site are available from Hutchison Drive and Extension Center Drive. The site is also visible from the adjacent CORE Greenhouse complex and the Bowley Plant Science Teaching Facility to the east, which includes 21 greenhouses, two headhouses and the Bowley Center. Research fields to the north of the CORE 2 Project site and an agricultural teaching field to the west of the CORE 2 Project site also obtain views of the Project site.

The Orchard Park Greenhouses site is visible from Orchard Park Drive and portions of Orchard Road. Views of the Orchard Park Greenhouses site are also available from three administrative buildings immediately to the north of the site, the Student Health and Wellness Center and Parking Lot #35 to the east, the Colleges at La Rue apartments to the south, and the Domes cooperative student housing complex and the Agriculture Field Station to the west.

6.1.2 2003 LRDP EIR Standards of Significance

The 2003 LRDP EIR considers an aesthetic impact significant if growth under the 2003 LRDP would:

- Have a substantial adverse effect on a scenic vista.

A scenic vista is defined as a publicly accessible viewpoint that provides expansive views of a highly valued landscape. On campus, the open view across agricultural lands west to the Coast

Range is considered a scenic vista. This vista is primarily viewed from public viewpoints along SR 113, Hutchison Drive, La Rue Road, and Russell Boulevard.

- Substantially degrade the existing visual character or quality of the site and its surroundings.

For the campus, this standard is interpreted in terms of the effect of development under the 2003 LRDP on the valued elements of the visual landscape identified in the LRDP, or the effect associated with allowing incompatible development in or near areas with high visual quality such as Putah Creek and the Arboretum Waterway.

- Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

An additional standard from the CEQA Guidelines' Environmental Checklist related to state scenic highways (Item b in the checklist below) was found not applicable to campus growth under the 2003 LRDP.

6.1.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP on aesthetics are evaluated in Section 4.1 of the 2003 LRDP EIR. The Project is within the scope of analysis in the 2003 LRDP EIR. Significant and potentially significant aesthetics impacts identified in the 2003 LRDP EIR that are relevant to the Project are presented below with their corresponding levels of significance before and after application of mitigation measures identified in the 2003 LRDP EIR. Mitigation measures are relevant to reduce the magnitude of cumulative impact 4.1-6, but this impact is identified as significant and unavoidable because the feasibility and/or implementation of mitigation falls within other jurisdictions and therefore cannot be guaranteed by the University of California.

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
AESTHETICS			
4.1-2	Development on campus from implementation of the 2003 LRDP could degrade the visual character of the campus by substantially degrading the valued elements of the visual landscape identified in the 2003 LRDP.	PS	LS
4.1-3	Development under the 2003 LRDP could create substantial light or glare on campus that could adversely affect daytime or nighttime views in the area.	PS	LS
4.1-4	Development under the 2003 LRDP together with other development in the region could affect local scenic vistas west across agricultural lands to the Coastal Range.	S	SU
4.1-5	Development allowed under the 2003 LRDP, in conjunction with other development in the region could substantially degrade the existing visual character or quality of the region.	S	SU
4.1-6	Implementation of the 2003 LRDP together with cumulative development in the region would create new sources of light and glare that could adversely affect daytime or nighttime views in the region.	S	SU

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

Mitigation measures in the 2003 LRDP EIR that are applicable to the Project are presented below. Since these mitigation measures are already being carried out as part of implementation of the 2003 LRDP, they

are considered part of the Project description and will not be readopted in this Initial Study or Negative Declaration. Nothing in this Initial Study in any way alters the obligations of the campus to implement the 2003 LRDP EIR mitigation measures.

2003 LRDP EIR Mitigation Measures

AESTHETICS

-
- 4.1-3(a) Design for specific projects shall provide for the use of textured nonreflective exterior surfaces and nonreflective glass.
 - 4.1-3(b) Except as provided in LRDP Mitigation 4.1-3(c), all new outdoor lighting shall utilize directional lighting methods with shielded and cutoff type light fixtures to minimize glare and upward directed lighting.
 - 4.1-3(c) Non-cutoff, non-shielded lighting fixtures used to enhance nighttime views of walking paths, specific landscape features, or specific architectural features shall be reviewed by the Campus Design Review Committee prior to installation to ensure that: (1) the minimum amount of required lighting is proposed to achieve the desired nighttime emphasis, and (2) the proposed illumination creates no adverse effect on nighttime views.
 - 4.1-3(d) The campus will implement the use of the specified lighting design and equipment when older lighting fixtures and designs are replaced over time.
 - 4.1-6(a) Implement LRDP Mitigation 4.1-3(a) and (b).
 - 4.1-6(b) The City of Davis and other surrounding jurisdictions can and should adopt (if necessary) and implement development standards and guidelines, which support the minimal use of site lighting for new developments.
-

6.1.4 Environmental Checklist and Discussion

AESTHETICS		Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...						
a)	Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

a) The 2003 LRDP EIR defined a scenic vista as an expansive view of a highly valued landscape from a publicly accessible viewpoint, and identified the only scenic vista on the UC Davis campus to be the view west across agricultural land to the Coast Range. On and near campus, viewpoints along SR 113, Hutchison Drive, La Rue Road, and Russell Boulevard provide scenic vistas to the west across agricultural land to the Coast Range (2003 LRDP EIR, page 4.1-7). Impact 4.1-4 of the 2003 LRDP EIR determined that cumulative development in the Davis region could obscure some scenic vistas, including development on campus under the 2003 LRDP. Construction at the CORE 2 site would take place within a developed portion of the UC Davis central campus between Extension Center Drive and Hutchison Drive. Demolition of existing

greenhouses on the Orchard Park Greenhouses site would be located southeast of Orchard Park Road and Orchard Road in a developed area surrounded primarily by student housing and services. The Project sites would be located east of SR 113 within the central campus and views to the west would be obstructed by existing buildings, structures, and trees. The height of proposed buildings would not exceed existing building heights on the Project sites. Therefore, the Project would not disrupt views of the Coast Range to the west and would result in a less-than significant contribution to this cumulative impact. Furthermore, cumulative growth in the region is consistent with that assumed in the 2003 LRDP EIR. This impact was adequately analyzed in the 2003 LRDP EIR and fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. Conditions have not substantially changed and no new information has become available since certification of the 2003 LRDP EIR that would alter this previous analysis.

b) According to the California Department of Transportation (Caltrans) State Scenic Highway Mapping System, neither the campus nor the Project site is located near a state scenic highway (Caltrans 2016). Additionally, the Orchard Park Greenhouses site is developed with existing greenhouses and support structures, and the CORE 2 Project site is located in a developed area and contains research/teaching fields. Both sites do not contain any scenic resources. Therefore, the Project would not damage scenic resources, either within or outside of a state scenic highway. No impact would occur.

c) The 2003 LRDP EIR found that development on the campus under the 2003 LRDP could degrade the visual character of the campus by substantially degrading the valued elements of the campus' visual landscape, which are identified above in the background discussion and include specific areas containing large numbers of trees, historic buildings, and open space areas (Impact 4.1-2). The Project would have no effect on valued elements of the UC Davis visual landscape because it would not be located in an area identified as having such elements, nor would it disturb an area of high visual quality. The CORE 2 Project site is located in the central campus, and contains teaching/research fields surrounded by similar uses and academic facilities. The Orchard Park Greenhouses site is located southeast of Orchard Park Road and Orchard Road and contains greenhouses and support structures. The proposed Project would construct two rectangular Cacao Germplasm Greenhouse structures, up to nine CORE 2 Phase 1 research greenhouses, headhouses and support buildings, and set aside a Future Expansion area suited for 25 to 30 additional greenhouses on the CORE 2 Project site. In addition to this, the Project would remove existing greenhouses at the Orchard Park Greenhouses site in phases as new greenhouses are constructed at the CORE 2 Project site. The visual character of the CORE 2 Project site is expected to change by replacing the largely vacant agricultural fields on the site with greenhouses. The CORE 2 Phase 1 research greenhouses would be aluminum-framed structures built on a cement slab and Cacao Germplasm Greenhouses would have exteriors made with Lexan twin walled polycarbonate panels. Paved access roads would be constructed to connect to the existing CORE driveway, along with limited parking that would include approximately five parking spaces located between the Cacao Germplasm area and the Phase 1 area. A storm water detention pond would be built at the southern end of the CORE 2 Project site, and a soils area would be retained in the northwest corner of the CORE 2 Project site. Existing trees on the CORE 2 Project site would be retained.

The proposed Cacao Germplasm Greenhouses and CORE 2 Phase 1 research greenhouses would be consistent with adjacent land uses to the east of the CORE 2 Project site, which contains existing CORE greenhouses. Proposed greenhouses would be similar in mass, scale, and visual character as existing greenhouses. Demolition of existing greenhouses on the Orchard Park Greenhouses site would remove buildings that are considered inconsistent with the 2003 LRDP *Student Housing* land use designation for the site. Existing greenhouses on the Orchard Park site would be demolished in phases, and during this time all furnishings and equipment, demolition debris, and utilities would be removed from the site and the site would be regraded. Hydro-seeding or other erosion control measures would be implemented as needed. As the proposed Project would maintain consistency with the existing visual character

surrounding the Project sites, the change to the visual character of the Project area would not represent a significant adverse effect. The impact to visual character from the Project would be less than significant.

The 2003 LRDP EIR determined that campus development under the 2003 LRDP, in conjunction with other development in the region, could conflict with the area's visual elements and other aspects of aesthetic character (LRDP Impact 4.1-5). The Project would include demolition of existing greenhouses and construction of new greenhouses and support buildings, utilities, parking, access roads, a soil area, and a detention pond within the existing footprint of the Project sites. Because all development would be within the existing developed central campus, no taller than existing structures, and consistent with LRDP planning and design guidelines (per the 2003 LRDP EIR Mitigation Measure 4.1-2(a)), the Project would result in a less-than significant contribution to this cumulative impact. Furthermore, cumulative growth in the region is consistent with that assumed in the 2003 LRDP EIR. This impact was adequately analyzed in the 2003 LRDP EIR and fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. Conditions have not substantially changed and no new information has become available since certification of the 2003 LRDP EIR that would alter this previous analysis.

d) The 2003 LRDP EIR found that development on the campus under the 2003 LRDP could create substantial light or glare that could adversely affect daytime or nighttime views in the area (Impact 4.1-3). The Project would demolish existing greenhouses on the Orchard Park Greenhouses site and construct two Cacao Germplasm greenhouses, up to nine Core 2 research greenhouses, and support buildings, utilities, limited parking, access roads, a soil area, and a detention pond on the CORE 2 Project site. During Project demolition and construction, lights could potentially be used for security, which would contribute to nighttime glare. However, this is a short-term effect. Cacao Germplasm Greenhouses would utilize LED lighting, and other CORE 2 greenhouses would use LED or energy efficient HPS lighting daily for up to 16 hours in the winter and up to 8 hours in the summer. The Project would use textured non-reflective exterior surfaces and non-reflective glass, in compliance with LRDP Mitigation 4.1-3(a), which would reduce glare from new buildings. In compliance with LRDP Mitigation 4.1-3(b-d), new outdoor lighting associated with the Project would be directional lighting with shielded and cutoff type light fixtures to minimize glare and light spill, except in specific, limited locations where lighting would be used to enhance nighttime views of walking paths, specific landscape features, or specific architectural features. In compliance with this measure, the Campus Design Review Committee will also review the Project's use of non-directional lighting design to ensure that no adverse effects on nighttime views would occur. With implementation of LRDP Mitigation 4.1-3(a-d), which is included in the Project, the Project's impact associated with light and glare would be less than significant.

The 2003 LRDP EIR found that campus development under the 2003 LRDP in conjunction with other cumulative development in the region would add new sources of light and glare that could adversely affect daytime or nighttime views in the area (LRDP Impact 4.1-6). LRDP Mitigation 4.1-6(a), included in the Project, requires the campus to implement Mitigation Measure 4.1-3(a) and (b), discussed above. LRDP Mitigation 4.1-6(b) states that local jurisdictions can and should adopt and implement development standards and guidelines that support reduced lighting. However, the feasibility and/or implementation of LRDP Mitigation 4.1-6(b) cannot be guaranteed by the University of California because enforcement and monitoring fall within other jurisdictions. For this reason, the cumulative impact is considered significant and unavoidable. This impact was adequately analyzed in the 2003 LRDP EIR and was fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. No conditions have changed and no new information has become available since certification of the 2003 LRDP EIR that would alter this previous analysis. However, it should be noted that the Project's contribution to this significant cumulative impact is not cumulatively considerable given that the Project would remove greenhouses on the Orchard Park Greenhouses site and construct a less than or equal to number of greenhouses on the CORE 2 Project site. These greenhouses would have a

similar lighting impact to existing greenhouses that would be removed as part of the proposed Project. As the Project would result in the use of lighting with shielded and cutoff type light fixtures to minimize glare and upward directed lighting, and would remove lighting associated with the Orchard Park Greenhouses site, a less than significant impact would occur.

6.2 AGRICULTURAL RESOURCES

6.2.1 Background

Section 4.2 of the 2003 LRDP EIR addresses the agricultural resources effects of campus growth under the 2003 LRDP. The following discussion summarizes information presented in the ‘Setting’ subsection of Section 4.2 of the 2003 LRDP EIR.

Environmental Setting

As discussed in the 2003 LRDP EIR, of the approximately 5,300 acres of campus land, the California Department of Conservation’s Farmland Mapping and Monitoring Program (FMMP) designates approximately 3,700 acres as Prime Farmland and approximately 90 acres as Farmland of Local Importance. The FMMP designates the remaining 1,520 acres of campus land as Urban and Built-Up (approximately 1,400 acres) and Other Land (approximately 120 acres). Most of the campus’ agricultural lands are located on the west and south campuses and at Russell Ranch. The central campus includes land primarily designated as Urban and Built-Up, but small areas within the central campus that are used for teaching and research fields and community gardens are designated as Prime Farmland.

The 2003 LRDP EIR identifies that development under the 2003 LRDP could result in conversion of approximately 745 acres of campus land that is designated Prime Farmland by the California Department of Conservation to nonagricultural uses. Approximately 330 acres of this land would be converted to habitat at Russell Ranch, which would not result in an irreversible loss of prime soil. Mitigation under the 2003 LRDP EIR requires the conservation of Prime Farmland at a one-to-one (1:1) ratio for Prime Farmland converted to developed uses and a one-third-to-one (1/3:1) ratio for Prime Farmland converted to habitat at Russell Ranch.

Project Site

The CORE 2 Project site is located within the central campus and is primarily designated as Prime Farmland on the California Department of Conservation FMMP Map for Yolo County, with the western portion of the CORE 2 Project site being designated as Urban and Built-Up Land (CDC 2015). The CORE 2 site contains research/teaching fields and the existing Tall Corn greenhouse building.

The Orchard Park Greenhouses site is located southeast of Orchard Park Road and Orchard Road and is designated as Urban and Built-Up Land on the California Department of Conservation FMMP Map for Yolo County (CDC 2015). The Orchard Park Greenhouses site includes existing greenhouse buildings and support structures.

6.2.2 2003 LRDP EIR Standards of Significance

The 2003 LRDP EIR considers an agricultural impact significant if growth under the 2003 LRDP would:

- Convert prime farmland, unique farmland or farmland of statewide importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency to nonagricultural use.

- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland considered prime, unique, or of statewide importance to nonagricultural use.
- Conflict with existing zoning for agricultural use or a Williamson Act contract.

6.2.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP on agricultural resources are evaluated in Section 4.2 of the 2003 LRDP EIR. The Project is within the scope of analysis in the 2003 LRDP EIR. A portion of the CORE 2 site is considered Prime Farmland. Therefore, significant agricultural impacts identified in the 2003 LRDP EIR are presented below with their corresponding levels of significance before and after application of mitigation measures identified in the 2003 LRDP EIR. As discussed in Section 7.2.4, below, the Project would not significantly contribute to the agricultural impacts identified in the 2003 LRDP EIR. For this reason, Mitigation Measure 4.2-1 would not apply to the Project

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
AGRICULTURAL RESOURCES			
4.2-3	Cumulative development would result in the conversion of prime farmland, unique farmland, and/or farmland of statewide importance to nonagricultural use.	S	SU

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

Mitigation measures in the 2003 LRDP EIR that are applicable to the Project are presented below. Since these mitigation measures are already being carried out as part of implementation of the 2003 LRDP, they are considered part of the Project description and will not be readopted in this Initial Study or Negative Declaration. Nothing in this Initial Study in any way alters the obligations of the campus to implement the 2003 LRDP EIR mitigation measures.

2003 LRDP EIR Mitigation Measures

AGRICULTURAL RESOURCES

- | | |
|-------|---|
| 4.2-1 | Prior to conversion of prime farmland to nonagricultural uses under the 2003 LRDP, the campus shall preserve approximately 525 acres of prime farmland either at the Russell Ranch, within the area designated for Teaching and Research Fields, or on the Kidwell and McConeghy parcels for agricultural purposes (including agricultural teaching and research). The campus will preserve prime farmland at a one-to-one (1:1) mitigation ratio for prime farmland converted to developed uses and a one-third-to-one (1/3:1) ratio for prime farmland converted to habitat at Russell Ranch. |
| 4.2-3 | Implement LRDP Mitigation 4.2-1. |

6.2.4 Environmental Checklist and Discussion

AGRICULTURAL AND FORESTRY RESOURCES					
Would the project...	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
a) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of forest land, timberland, or Timberland Production land?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) The FMMP designates the Orchard Park Greenhouses site as Urban and Built-Up Land. The existing CORE site, and the easterly portion of the CORE 2 site is designated as Urban and Built-Up Land. However, the westerly CORE 2 area is designated Prime Farmland (with the exception of the drainage and soil storage areas, which are Urban and Built-Up Land). This westerly farmland area would be used for the future phases of the CORE 2 greenhouses within the next ten years. Greenhouses are considered compatible with both the University's designation of Teaching and Research Fields and with the FMMP designation of Prime Farmland. Both the current and proposed land use is agricultural, although the fields would be used for greenhouse growing and cultivation, rather than field crops or orchards. Furthermore, the structures do not represent a permanent conversion of farmland – the greenhouses can be decommissioned (as is occurring at the Orchard Park site). Therefore, the project-specific impact is less than significant.

Impact 4.2-3 of the 2003 LRDP EIR concluded that campus development under the 2003 LRDP, in conjunction with other development in the region, would result in a significant and unavoidable cumulative impact related to the conversion of Important Farmland to non-agricultural uses in the region. Although Yolo County, Solano County, the City of Davis, and UC Davis have established goals to preserve agricultural lands, the 2003 LRDP EIR anticipated that development proposed under the City of Davis General Plan Update (2001) could result in the conversion of approximately 450 acres of prime farmland through 2010 (Jones & Stokes, 2000). The 2003 LRDP also stated that additional conversion of agricultural land could occur beyond the City's current planning horizon through 2015-16. The loss of approximately 745 acres of prime farmland on the UC Davis campus in combination with the conversion of prime farmland anticipated under the City's General Plan represents a significant adverse impact. Although UC Davis requires mitigation for loss of prime farmland on campus through conserving 525 acres of prime farmland at Russel Ranch (2003 LRDP Mitigation 4.2-3), it does not replace agricultural

land lost. Because reconversion of developed lands to agricultural uses is considered infeasible, the cumulative loss of prime farmland is considered to be a significant and unavoidable impact.

As described above, the Project would not convert Farmland to non-agricultural use, and therefore would not contribute to the campus' significant and unavoidable farmland conversion impact. This impact was adequately analyzed in the 2003 LRDP EIR and fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. Conditions have not substantially changed and no new information has become available since certification of the 2003 LRDP EIR that would alter this previous analysis.

b) Campus lands are state lands and are not eligible for Williamson Act agreements, nor are they subject to local zoning controls. The Orchard Park Greenhouses site is designated as Urban and Built-Up Land by the FMMP and as Student Housing by the 2003 LRDP. The CORE 2 Project site is designated as Prime Farmland and Urban and Built-Up Land by the FMMP and as Academic/Administrative High Density and Teaching and Research Fields by the 2003 LRDP. No changes in land use designation would occur with the Project. Therefore, no effect on agricultural zoning would result and the Project would not conflict with existing zoning for agricultural use or a Williamson Act contract, and no impact would occur.

c) The *State CEQA Guidelines* were amended after the 2003 LRDP EIR was certified to add new checklist criteria related to forest lands and agriculture that were not required or considered in the LRDP EIR. The Project would not have impacts related to loss or conversion of forest lands because no forest lands are present on or in the vicinity of the Project site. For this reason and the reasons discussed above, the Project would not involve changes to the existing environment that could cause conversion of Farmland or forest land to non-agricultural use.

e) The 2003 LRDP encouraged development on the campus to cluster around developed areas and infill where possible. The LRDP established boundaries for development on campus agricultural lands and included all conversion of campus agricultural land through 2015-16. The redesignations and/or conversions of agricultural land to non-agricultural use planned for within the LRDP are not expected to cause conversion of agricultural land or conflicts with agricultural activities on adjacent non-UC land, as the campus is primarily surrounded by developed, urban uses. Agricultural lands surrounding the campus are unlikely to be converted to other uses, as they either do not contain existing utilities and services necessary to support urban development or are designated for agriculture within county general plans, where several county policies discourage conversion of farmland. The Project sites are located within a developed area in the central campus. The CORE 2 Project site is surrounded by existing campus uses, including agricultural research/teaching fields, Extension Center Drive, the CORE greenhouse complex and the Bowley Plant Sciences Teaching Facility. The Orchard Park Greenhouses site is located in a developed area surrounded by student housing and services. As development on campus lands surrounding the Project sites was considered in the LRDP, and no non-UC agricultural lands exist near the Project sites, the potential for the Project to cause off-site agricultural land to be converted to urban uses is low and would be a less than significant impact, per the LRDP EIR analysis.

6.3 AIR QUALITY

6.3.1 Background

Section 4.3 of the 2003 LRDP EIR addresses the air quality effects of campus growth under the 2003 LRDP on air quality. The following discussion summarizes information presented in the 'Setting' subsection of Section 4.3 of the 2003 LRDP EIR.

Climate and Topography

The Project is located within the Sacramento Valley Air Basin (SVAB), which includes Sacramento, Shasta, Tehama, Butte, Glenn, Colusa, Sutter, Yuba, Yolo, and portions of Solano and Placer counties and is within the jurisdictional boundaries of the Yolo-Solano Air Quality Management District (YSAQMD). The SVAB extends from south of Sacramento to north of Redding and is bounded on the west by the Coast Ranges and on the north and east by the Cascade Range and Sierra Nevada. The Project is located within southern Yolo County. The area experiences hot dry summers while winters tend to be mild and rainy.

Weather patterns throughout the SVAB are affected by geography. Mountain ranges tend to buffer the basin from the marine weather systems that originate over the Pacific. However, the Carquinez Strait creates a breach in the Coast Range on the west of this basin, which exposes the midsection of the SVAB to marine weather. This marine influence moderates climatic extremes, such as the cooling that sea breezes provide in summer evenings. These breezes also help to move pollutants out of the valley. During about half of the days from July to September, however, a phenomenon called the “Schultz Eddy” prevents this from occurring. Instead of allowing for the prevailing wind patterns to move north carrying the pollutants out of the valley, the Schultz Eddy causes the wind pattern to circle back south. Essentially this phenomenon causes the air pollutants to be blown south toward the Sacramento area. This effect exacerbates the pollution levels in the area and increases the likelihood of violating federal or state standards. The effect normally dissipates around noon when the delta sea breeze arrives.

Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include ozone (O₃), nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), particulate matter equal to or less than 10 microns in aerodynamic diameter (PM₁₀), particulate matter equal to or less than 2.5 microns in aerodynamic diameter (PM_{2.5}), and lead (Pb). In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants.

Toxic Air Contaminants

Toxic air contaminants (TACs) are toxic substances released into the air, which have the potential to cause adverse health effects in humans. TACs are generated by a number of sources, including stationary sources such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources such as automobiles; and area sources such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and non-carcinogenic effects. Non-carcinogenic effects typically affect one or more target organ systems and may be experienced either on short-term (acute) or long-term (chronic) exposure to a given TAC. Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos.

Regulatory Setting

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The U.S. Environmental Protection Agency (EPA) is responsible for implementing most aspects of the federal Clean Air Act, including setting National Ambient Air Quality Standards (NAAQS) for major air pollutants; approving state attainment plans; setting motor

vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric O₃ protection measures, and enforcement provisions. The federal Clean Air Act delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to the California Air Resources Board (CARB), with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California Environmental Protection Agency (CalEPA) in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the federal Clean Air Act, and regulating emissions from motor vehicles and consumer products. CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS.

The designation of an area as attainment or nonattainment of the NAAQS and CAAQS is based on monitored data throughout the SVAB. The entire SVAB is designated as a nonattainment area for both federal and state O₃ standards (EPA 2017a, CARB 2016). The EPA has classified the SVAB as a “severe” nonattainment area for the 8-hour O₃ standard and has mandated that it achieve attainment no later than June 15, 2019. In addition, the SVAB is designated as a nonattainment area for the state PM₁₀ standard and nonattainment for the federal PM_{2.5} standard. The SVAB is in attainment or unclassified for all other criteria air pollutants.

Project Site

The CORE 2 Project Site is located in the central campus between Extension Center Drive and Hutchison Drive. The CORE 2 Project Site currently includes agricultural research/teaching fields and the Tall Corn greenhouse building. Air quality on the campus on any given day is influenced by both meteorological conditions and pollutant emissions. In general, meteorological conditions vary more than pollutant emissions from day to day, and tend to have a greater influence on changes in measured ambient pollutant concentrations. Ambient concentrations of CO and PM₁₀, however, are particularly influenced by local emission sources.

The Orchard Park Greenhouses site is located southeast of Orchard Park Road and Orchard Road and contains greenhouses and support structures. The Orchard Park site is primarily surrounded by student housing and services, including the Russell Park Apartments to the north, the Colleges at La Rue apartments to the south, and the Domes cooperative student housing complex to the west.

6.3.2 2003 LRDP EIR Standards of Significance

The 2003 LRDP EIR considers an air quality impact significant if growth under the 2003 LRDP would:

Criteria Pollutants

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation. (According to the YSAQMD, emissions of nitrogen oxides (NO_x) and reactive organic gases (ROG) in excess of 10 tons per year, PM₁₀ emissions of 80 pounds a day, or CO emissions violating a state ambient air standard for CO would be considered significant (YSAQMD 2007).
- 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors).

- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

Toxic Air Contaminants

- Contribute to the probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeding the AB 2588 and Proposition 65 threshold of 10 in one million.
- Result in a noncarcinogenic (chronic and acute) health hazard index greater than the AB 2588 threshold of 1.0.

6.3.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP on air quality are evaluated in Section 4.3 of the 2003 LRDP EIR. As analyzed in Section 4 of this Initial Study, the Project is within the scope of analysis in the 2003 LRDP EIR. Significant and potentially significant air quality impacts identified in the 2003 LRDP EIR that are relevant to the Project are presented below with their corresponding levels of significance before and after application of mitigation measures identified in the 2003 LRDP EIR. Mitigation is required to reduce the magnitude of project-level LRDP Impact 4.3-1 and cumulative LRDP Impact 4.3-6, but these impacts are identified as significant and unavoidable because they cannot be fully mitigated. Mitigation is identified to reduce the magnitude of project-level LRDP Impact 4.3-3, but this impact is identified as significant and unavoidable due to uncertainty about the effectiveness of the mitigation.

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
AIR QUALITY			
4.3-1	Implementation of the 2003 LRDP would result in daily operational emissions above the YSAQMD thresholds that may contribute substantially to a violation of air quality standards or hinder attainment of the regional air quality plan.	S	SU
4.3-3	Emissions from construction activities associated with the 2003 LRDP would exceed YSAQMD thresholds.	S	SU
4.3-6	Implementation of the 2003 LRDP, in conjunction with other regional development, would result in a cumulatively considerable increase of non-attainment pollutants.	S	SU
4.3-8	Regional growth could result in an increase in toxic air contaminants if compensating technological improvements are not implemented.	PS	LS

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

Mitigation measures in the 2003 LRDP EIR that are applicable to the Project are presented below. Since these mitigation measures are already being carried out as part of implementation of the 2003 LRDP, they are considered part of the Project description and will not be readopted. Nothing in this Initial Study in any way alters the obligations of the campus to implement 2003 LRDP EIR mitigation measures.

2003 LRDP EIR Mitigation Measures

AIR QUALITY

- 4.3-1(a) Vehicular Sources. The following measures will be implemented to reduce emissions from vehicles, as feasible.
- The campus shall continue to actively pursue Transportation Demand Management to reduce reliance on private automobiles for travel to and from the campus.
 - Provide pedestrian-enhancing infrastructure to encourage pedestrian activity and discourage vehicle use.
 - Provide bicycle facilities to encourage bicycle use instead of driving.
 - Provide transit-enhancing infrastructure to promote the use of public transportation.
 - Provide facilities to accommodate alternative-fuel vehicles such as electric cars and CNG vehicles.
 - Improve traffic flows and congestion by timing of traffic signals to facilitate uninterrupted travel.
 - When the campus purchases new vehicles, the campus will evaluate the practicality and feasibility of acquiring low-pollution vehicles that are appropriate for the task and will purchase these types of vehicles when practical and feasible. When replacing diesel engines in existing equipment, the campus will install up-to-date technology.
- 4.3-1(b) Area Sources. The following measures will be implemented to reduce emissions from area sources, as feasible.
- Use solar or low-emission water heaters in new or renovated buildings.
 - Orient buildings to take advantage of solar heating and natural cooling and use passive solar designs.
 - Increase wall and attic insulation in new or renovated buildings.
 - For fireplaces or wood-burning appliances, require low-emitting EPA certified wood-burning appliances, or residential natural-gas fireplaces.
 - Provide electric equipment for landscape maintenance.
- 4.3-1(c) The campus will work with the YSAQMD to ensure that emissions directly and indirectly associated with the campus are adequately accounted for and mitigated in applicable air quality planning efforts. The YSAQMD can and should adopt adequate measures consistent with applicable law to ensure that air quality standard violations are avoided.
- 4.3-3(a) The campus shall include in all construction contracts the measures specified below to reduce fugitive dust impacts, including but not limited to the following:
- All disturbed areas, including storage piles, which are not being actively utilized for construction purpose, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, or vegetative ground cover.
 - All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
 - All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
 - When demolishing buildings up to six stories in height, all exterior surfaces of the building shall be wetted during demolition.
 - When materials are transported off-site, all material shall be covered, effectively wetted to limit visible dust emissions, or at least two feet of freeboard space from the top of the container shall be maintained.
 - All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours when operations are occurring. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices also is expressly forbidden.
 - Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions by utilizing sufficient water or chemical stabilizer/ suppressant.

2003 LRDP EIR Mitigation Measures

AIR QUALITY

- 4.3-3(b) The campus shall include in construction contracts for large construction projects near receptors, the following control measures:
- Limit traffic speeds on unpaved roads to 15 mph.
 - Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.
 - To the extent feasible, limit area subject to excavation, grading, and other construction activity at any one time.
 - Limit the area subject to excavation, grading, and other construction activity at any one time.
- 4.3-3(c) The campus shall implement the following control measures to reduce emissions of ozone precursors from construction equipment exhaust:
- To the extent that equipment is available and cost effective, the campus shall encourage contractors to use alternate fuels and retrofit existing engines in construction equipment.
 - Minimize idling time to a maximum of 5 minutes when construction equipment is not in use.
 - To the extent practicable, manage operation of heavy-duty equipment to reduce emissions.
 - To the extent practicable, employ construction management techniques such as timing construction to occur outside the ozone season of May through October, or scheduling equipment use to limit unnecessary concurrent operation.
- 4.3-6 Implement LRDP Mitigation 4.3-1(a-c).
- 4.3-8 EPA and CARB are expected to continue the development and implement programs to reduce air toxics, and UC Davis will continue its efforts in this area.

6.3.4 Environmental Checklist and Discussion

AIR QUALITY

Would the project...	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a,b,c,d) **Construction**

The 2003 LRDP EIR found that emissions of criteria pollutants from construction activities under the 2003 LRDP could exceed YSAQMD thresholds (LRDP Impact 4.3-3). The state 24-hour PM₁₀ standards could be violated when multiple construction projects (especially projects that involve ongoing grading or excavation activities) occur simultaneously in the same area. Construction of the Project would result in a temporary addition of pollutants to the local air shed caused by soil disturbance, fugitive dust emissions, and combustion pollutants from on-site construction equipment, as well as from off-site trucks hauling demolition debris and from construction workers travelling to and from the site. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation and, for dust, the prevailing weather conditions. Therefore, an increment of day-to-day variability exists.

Pollutant emissions associated with construction of the Project were quantified using California Emissions Estimator Model (CalEEMod), Version 2016.3.1. Default values provided by the program were used where detailed project information was not available. A detailed depiction of the construction schedule—including information regarding phasing, equipment utilized during each phase, haul trucks, vendor trucks, and worker vehicles—is contained in the CalEEMod outputs, provided in Appendix B.

Construction on the CORE 2 site is anticipated to begin in the Fall of 2017. However, in order to provide the maximum emissions per calendar year (rather than split across several years), this analysis assumed construction would begin January 1, 2018. It was assumed that total construction and demolition would occur over a period of 10 years, with each year consisting of an estimated 7-month construction period followed by 3 weeks of demolition at the Orchard Park site, then resuming again the next calendar year. Demolition would occur in phases tied to the completion of new greenhouses at the CORE 2 site. Notably, since it was assumed that the same amount of construction and demolition would occur each year, only one period of construction and demolition was modeled to estimate the annual emissions. The analysis contained herein is based on the following assumptions (duration of phases is approximate):

- Site preparation: 20 days
- Grading: 20 days
- Building construction: 100 days
- Paving: 11 days
- Architectural coating: 11 days
- Demolition: 15 days

CalEEMod was used to quantify emissions of ozone precursors (ROG and NO_x) and PM₁₀ emissions from off-road equipment, haul trucks associated with demolition, grading, on-road worker vehicle emissions, and vendor delivery trips. Construction of the Project would also generate CO, SO_x and PM_{2.5} emissions, which are provided in Appendix B; however, only the criteria air pollutants that the YSAQMD have adopted thresholds are presented in **Table 7-1, Estimated Construction Emissions**.

Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM₁₀ and PM_{2.5} emissions. As described above, the LRDP included Measure 4.3-3(a) in order to minimize dust emissions. To account for compliance with Measure 4.3-3(a), it was assumed that the active sites would be watered at least twice daily, or as necessary depending on weather conditions, resulting in a 55% reduction in fugitive dust as implemented by CalEEMod. Annual

ROG and NO_x and predicted worst-case day PM₁₀ construction emissions for the typical construction period are presented in Table 7-1 and compared to the YSAQMD significance thresholds.

**Table 7-1
Estimated Construction Emissions**

Year	ROG	NO _x	PM ₁₀
	<i>tons per year</i>		<i>pounds per day</i>
Year 2018 – Representative Construction Period Emissions	0.10	0.89	1.50
<i>Pollutant Threshold</i>	<i>10</i>	<i>10</i>	<i>80</i>
Threshold Exceeded?	No	No	No

Notes: PM₁₀ values shown are the maximum summer or winter daily emissions results from CalEEMod. Detailed results are included in Appendix B.

These estimates reflect implementation of the LRDP Measure 4.3-3(a) for fugitive dust control. YSAQMD has adopted construction thresholds for ROG, NO_x, and PM₁₀.

ROG = reactive organic gases; NO_x = oxides of nitrogen; PM₁₀ = coarse particulate matter

As shown in Table 7-1, annual ROG and NO_x emissions and daily PM₁₀ construction emissions would be minimal and would not exceed the YSAQMD significance thresholds during construction. Therefore, construction criteria air pollutant impacts of the Project would be less than significant and no additional mitigation measures are required.

There are existing sensitive receptors proximate to the Project and Orchard Park sites. The Project site is located about 750 feet south of the Colleges at La Rue Apartments and the Hutchison Child Development Center. The Orchard Park Greenhouses to be demolished are located about 75 feet east of the Domes and 225 feet north of the Colleges at La Rue Apartments. As provided in Table 7-1, construction activities for the Project would result in minimal emissions of criteria air pollutants and would not result in the potential for significant cumulative air quality impacts on nearby sensitive receptors.

Operation

Following the completion of construction activities, the Project would generate criteria pollutant emissions primarily from energy sources (natural gas combustion for heating). Existing and Project natural gas use estimates are based on the square footage of greenhouses under each scenario and therms were provided by UC Davis for several other metered greenhouses on campus (UC Davis 2017). In addition, the Project would generate off-site mobile emissions for employee trips. However, the Project would employ only 10 staff at the greenhouses, with employee trips already considered in the 2003 LRDP EIR. Therefore, the minimal emissions from mobile sources were not quantified for this analysis.

Based on the above information, the estimated operational emissions from the Project and the existing Orchard Park Greenhouses to be demolished are provided below in **Table 7-2, Estimated Unmitigated Operational Emissions**.

**Table 7-2.
Estimated Unmitigated Operational Emissions**

Source	ROG	NO _x	PM ₁₀
	<i>tons per year</i>		<i>pounds per day</i>
<i>Existing Orchard Park Greenhouses</i>			
Total Existing - Energy Emissions	0.02	0.10	0.16

**Table 7-2.
Estimated Unmitigated Operational Emissions**

Source	ROG	NO _x	PM ₁₀
	tons per year		pounds per day
<i>Proposed Project</i>			
Total Project - Energy Emissions	0.03	0.12	0.20
Net Change (Project minus Existing)	0.01	0.02	0.04
<i>Pollutant Threshold</i>	<i>10</i>	<i>10</i>	<i>80</i>
Threshold Exceeded?	No	No	No

Notes: Natural gas usage based on representative metered greenhouses on campus and applied to both the Existing and Project scenario. Emission factors for natural gas boilers are based on CalEEMod 2016.3.1. Detailed results are included in Appendix B.

tpy = tons per year; lb/day = pounds per day; ROG = reactive organic gases; NO_x = oxides of nitrogen; PM₁₀ = coarse particulate matter

As shown in Table 7-2, ROG, NO_x, and PM₁₀ emissions from Project operations would be minimal and would not exceed the YSAQMD thresholds of significance. The 2003 LRDP EIR found that operational emissions from campus development under the 2003 LRDP could substantially contribute to a violation of ambient state and federal air quality standards or hinder the attainment of the regional air quality plan (LRDP Impact 4.3-1). The Project would contribute to this impact. However, as shown in Table 7-2, development of the Project would result in a negligible contribution of emissions. UC Davis is located in an area that is in nonattainment of state O₃ and PM₁₀ standards. As a part of the Sacramento Federal Nonattainment area, the YSAQMD adopted the *Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan (2013 SIP Revisions)*, which addresses attainment of the federal 8-hour ozone standard (YSAQMD et al 2013), while the *Draft Triennial Assessment and Plan Update* addresses attainment of the California 1-hour and 8-hour ozone standards (YSAQMD 2016). These applicable air quality plans are intended to implement regulations for ozone emissions and attainment of the air quality standards.

LRDP EIR Mitigation Measures 4.3-1 (a) and (b), encourage alternative transportation and no- or low-emission building designs and operations in order to reduce daily emissions from campus vehicular and stationary sources. LRDP Mitigation Measure 4.3-1(c) would ensure that UC Davis will coordinate with the YSAQMD during air quality planning efforts. However, since the 2003 LRDP resulted in an exceedance of O₃ standards even with mitigation, the 2003 LRDP could potentially conflict with or obstruct implementation of the regional air quality plan. The impact is considered significant and unavoidable at the LRDP program level. This impact was adequately analyzed in the 2003 LRDP EIR and was fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. No conditions have changed and no new information has become available since certification of the 2003 LRDP EIR that would alter this previous analysis.

Toxic Air Contaminants

The Project would not include any substantial sources of TACs. Health Risk Assessment (HRA) calculations performed as part of the 2003 LRDP EIR predicted that the cancer risk from campus operations would be below 10 in one million for both the off-campus and on-campus Maximally Exposed Individual, which assumed a 70-year exposure period. The non-cancer health risk was calculated to be below 1.0 on the hazard index. Therefore, the 2003 LRDP EIR concluded that development under the 2003 LRDP would not exceed either health risk standard, and the impact associated with TAC generation would be less than significant.

Cumulative Development

Impact 4.3-6 of the 2003 LRDP EIR found that implementation of the 2003 LRDP, in conjunction with other regional development, would contribute to emissions of criteria pollutants for which the region is nonattainment with respect to ambient air quality standards. The YSAQMD has accounted for a certain amount of regional growth within both the *2013 SIP Revisions* and the *Draft Triennial Assessment and Plan Update*; both of which account for future growth of UC Davis. The Project would be required to comply with LRDP Mitigation Measures 4.3-1 (a) through (c), however, because the YSAQMD remains a nonattainment area for O₃, cumulative impacts would be considered significant and unavoidable. The Project is within the development assumptions analyzed in the 2003 LRDP EIR. Because the Project would not increase campus population or regional population beyond levels already anticipated under the LRDP, the project would not result in new or substantially worse impacts related to emissions of criteria pollutants. As discussed above, the project would not result in construction emissions of ROG, NO_x, or PM₁₀ that would exceed YSAQMD's thresholds of significance for construction emissions. Further, the project would not emit operational emissions that would exceed YSAQMD's thresholds. Therefore, the project would result in a less-than-significant contribution to this cumulative impact. This impact was adequately analyzed in the 2003 LRDP EIR and was fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. No conditions have changed and no new information has become available since certification of the 2003 LRDP EIR that would alter this previous analysis.

Impact 4.3-8 of the 2003 LRDP EIR evaluated whether regional growth could result in an increase in toxic air contaminants if compensating technological improvements are not implemented. The analysis concluded that because the U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB) were expected to continue the development and implementation of programs to reduce air toxics, and UC Davis would continue its efforts in this area, the impact would be less than significant. The Project is within the scope and development assumptions of the 2003 LRDP and would not result in any new or substantially worse impacts related to toxic air contaminants. This impact was adequately analyzed in the 2003 LRDP EIR. Conditions have not substantially changed and no new information has become available since certification of the 2003 LRDP EIR that would alter this previous analysis.

e) The 2003 LRDP EIR concluded that odor impacts associated with development under the 2003 LRDP would be less than significant. During construction and demolition activities, the various diesel-powered vehicles and equipment used onsite would create localized odors. These odors would be temporary and would not likely be noticeable for extended periods of time beyond the Project's site boundaries. Typical land uses identified as sources of objectionable odors include landfills, transfer stations, sewage treatment plants, wastewater pump stations, composting facilities, feed lots, coffee roasters, asphalt batch plants, and rendering plants. The Project does not include any of these types of facilities. Therefore, the Project would not have the potential to expose persons to substantial sources of objectionable odors and impacts would be less than significant.

6.4 BIOLOGICAL RESOURCES

6.4.1 Background

Section 4.4 of the 2003 LRDP EIR addresses the effects of campus growth under the 2003 LRDP on biological resources. The following discussion summarizes information presented in the 'Setting' subsection of Section 4.4 of the 2003 LRDP EIR.

Environmental Setting

The 5,300-acre campus is located in a region that is composed primarily of urban areas and agricultural lands that include remnant riparian areas (Figure 1). Habitat types on the campus can be classified as Agricultural Lands (including Cropland/Pasture, and Orchard/Vineyard), Valley Foothill Riparian Woodland, Ruderal/Annual Grassland, Open Water Ponds, Riverine, and Urban Landscaping/Developed.

The CORE 2 Project site is located in the central campus, between Extension Center Drive and Hutchison Drive. The Core 2 Project site contains agricultural research/teaching fields and is bounded by Highway 113 to the west, Hutchison Drive to the south and by greenhouses and similar academic uses to the east and north. The center of the site is located approximately 0.03 miles east of Highway 113.

The Orchard Park Greenhouses site is located southeast of Orchard Park Road and Orchard Road. The Orchard Park Greenhouses site is primarily surrounded by student housing and services and contains greenhouses and other support structures and teaching facilities.

The 2003 LRDP EIR considers special-status species to be those taxa that are: (1) listed as threatened or endangered under either the California or Federal Endangered Species Acts; (2) candidates for either state or federal listing; (3) species afforded protection under the Fish and Game Code of California; (4) federal and California Department of Fish and Game (CDFG) “Species of Special Concern”; (5) CDFG “Species of Special Concern” highest and second priority lists; or (6) California Native Plant Society (CNPS) List 1-3 plants.

Habitat

The Orchard Park Greenhouses site is classified as Urban/Developed by the LRDP. Urban habitat as defined in the LRDP EIR includes landscaped areas that are vegetated with trees, shrubs, and maintained grassy areas; however, landscaping is minimal within the Project area due to multiple structures occurring within a mostly paved or gravel filled area. No natural vegetation communities exist within the site. The project area mostly lacks vegetation, except for some weedy species around the edges of the site and mature trees that occur along the northern and southern boundaries (Figure 4). This area provides limited habitat for special-status wildlife species; however, common urban species could use some areas around the periphery of the site for cover and foraging. Avian species could also use the buildings within the site and trees along the periphery of the site for nesting.

The Core 2 Project area is classified as Academic/Administrative High Density in the 2003 LRDP, with the westernmost portion of the site being designated as Teaching and Research Fields. The Academic/Administrative High Density area includes the existing Tall Corn Greenhouse. To the east are the CORE greenhouses and access roads. The teaching and research fields are regularly irrigated. A small area of undeveloped disturbed habitat exists along the western and southern edges of the site and consists of mostly bare ground and some non-native ruderal plant species, bordered by mature native and non-native trees and shrubs. No natural vegetation communities exist within the site, and the site provides limited habitat for special-status wildlife species. Common urban wildlife species could use the Teaching and Research Fields for foraging and the vegetation around the periphery of the site for cover. Avian species could use the surrounding trees and shrubs for nesting.



Center of Orchard Park greenhouses site



Typical roofing on Orchard Park greenhouses building



Orchard Park greenhouses site



Southwestern corner of Orchard Park greenhouses site



Looking south through Core 2 soils area



Looking west through Core 2 site

Date: 9/12/2017... Last saved by: istoddie... Path: Z:\Projects\9730\IMAP\DOC\DOCUMENT\Comp\Phase 1\Greenhouse\BoF\Figures - Site Photos.mxd

INTENTIONALLY LEFT BLANK

Special-Status Species

Swainson's Hawk. Swainson's hawk (*Buteo swainsoni*) is listed as a threatened species under the California Endangered Species Act and is also fully protected against take pursuant to Section 3503.5 of the Fish and Game Code of California. Swainson's hawk is a relatively large bird of prey that typically nests in large trees in riparian corridors as well as isolated trees remaining in or adjacent to agricultural fields in the Central Valley. However, in the City of Davis, and on the central campus, these hawks also nest in the large trees among buildings, roads, and dwellings.

This species forages in open grassland habitats and has adjusted to foraging in certain types of agricultural lands. The value of foraging habitat can be affected by a variety of characteristics, including density and availability of prey, proximity to anthropogenic features that could cause disturbance, and distance to nesting territories. Published information indicates these raptors typically forage within a 10-mile radius of nest sites but may range up to 18 miles from a nest site in search of suitable foraging habitat and available prey. Formal studies have shown that Swainson's hawks will spend the majority of foraging time in close proximity to the nest site when high quality foraging habitat (measured by the abundance and availability of prey) is present.

Occurrences of Swainson's hawk in and around the campus are well documented. UC Davis conducted yearly surveys for Swainson's hawk nests on the campus and within one half mile of the campus from 1991 through 1998. Project-specific surveys have been conducted annually since 1998. The results of these surveys documented approximately 20 active nests per year and a total of approximately 50 total nests within one-half mile of the campus over the decade. Most of the Swainson's hawk nests are located in the Putah Creek riparian corridor.

Trees

A biological reconnaissance survey of both Project sites was conducted and several trees were observed along the periphery of both sites. In accordance with the campus practice for identifying trees to preserve during a development or redevelopment project and in compliance with LRDP Mitigation 4.4-11, these trees could have value as "heritage" or "specimen" trees. However, no trees are planned for removal under the project, so no trees were evaluated for "heritage" or "specimen" status.

6.4.2 2003 LRDP EIR Standards of Significance

The 2003 LRDP EIR considers a biological resources impact significant if growth under the 2003 LRDP would:

- Result in 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 Wildlife (CDFW) or U.S. Fish and Wildlife Service (USFWS).
- Result in the "take" (defined as kill, harm, or harass) of any listed threatened or endangered species or the habitat of such species.
- Result in a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS.
- Result in a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, or coastal wetland) through direct removal, filling, hydrological interruption, or other means.

- 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.
- Conflict with any applicable local policies protecting biological resources such as a tree protection policy or ordinance.

An additional standard from the CEQA Guidelines’ Environmental Checklist (“F” in the checklist below) was found not applicable to campus growth under the 2003 LRDP.

6.4.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP on biological resources are evaluated in Section 4.4 of the 2003 LRDP EIR. The Project is within the scope of analysis in the 2003 LRDP EIR and the significant and potentially significant biological resources impacts identified in the 2003 LRDP EIR that are relevant to the Project are presented below with their corresponding levels of significance before and after application of mitigation measures identified in the 2003 LRDP EIR. Mitigation measures are relevant to reduce the magnitude of cumulative LRDP Impact 4.4-11, but this impact is identified as significant and unavoidable because the feasibility and/or implementation of mitigation falls within other jurisdictions and therefore cannot be guaranteed by the University of California.

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
BIOLOGICAL RESOURCES			
4.4-1	Development allowed under the 2003 LRDP could result in the loss of special-status plant species or species that may be added to the special-status plant list in the future.	PS	LS
4.4-2	Development allowed under the 2003 LRDP would result in the conversion of approximately 550 acres of Agricultural Land and Ruderal/Annual Grassland habitat to campus-related development which would result in the loss of general wildlife habitat for resident and migratory species, including foraging habitat for the Swainson’s hawk.	S	LS
4.4-3	Development allowed under the 2003 LRDP would result in the conversion of approximately 65 acres of Agricultural Land and Ruderal/Annual Grassland habitat suitable for nesting burrowing owls to campus-related development.	PS	LS
4.4-4	Development allowed under the 2003 LRDP could result in the failure of nesting efforts by nesting raptors, including Swainson’s hawks or other birds of prey.	PS	LS
4.4-5	Development allowed under the 2003 LRDP would result in the loss of active nest sites for Swainson’s hawk.	PS	LS
4.4-6	Development allowed under the 2003 LRDP would result in the loss of potential habitat for the VELB.	PS	LS
4.4-7	Development allowed under the 2003 LRDP could result in the loss of potential habitat for the northwestern pond turtle from drainage improvement projects, bank stabilization measures and landscape maintenance activities within Riverine habitat along Putah Creek and the Arboretum Waterway.	PS	LS

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
BIOLOGICAL RESOURCES			
4.4-11	Development under the 2003 LRDP could result in the removal of trees recognized to meet the campus' standards for important trees, including: a. Heritage Trees: Healthy valley oak trees with trunk diameters of 33 inches or greater at a height of 54 inches from the ground. b. Specimen Trees: Healthy trees or stands of trees that are of high value to the campus due to their size, species, extraordinary educational and research value, and/or other exceptional local importance.	LS	LS
4.4-12	Development allowed under the 2003 LRDP would contribute 550 acres to the cumulative loss in the region of over 1,500 acres of Agricultural Land and Ruderal/Annual Grassland habitat for resident and migratory wildlife speices including Swainson's hawks and burrowing owls.	S	SU
4.4-13	Development allowed under the 2003 LRDP could contribute to the cumulative loss in the region of wetland and riparian habitat for resident and migratory wildlife species and special status plants.	S	SU
4.4-14	Development allowed under the 2003 LRDP could contribute to the cumulative loss of valley elderberry beetle habitat.	S	SU
4.4-15	Development of the 2003 LRDP would not contribute to a cumulative adverse impact on special status fish species.	LS	LS

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

Mitigation measures in the 2003 LRDP EIR that are applicable to the Project are presented below. Since these mitigation measures are already being carried out as part of implementation of the 2003 LRDP, they are considered part of the Project description and will not be readopted in this Initial Study or Negative Declaration. Nothing in this Initial Study in any way alters the obligations of the campus to implement 2003 LRDP EIR mitigation measures.

2003 LRDP EIR Mitigation Measures

BIOLOGICAL RESOURCES

- 4.4-1(a) During the project planning phase, the campus shall conduct a rare plant survey if the site is previously undeveloped and is in a valley-foothill riparian, open water pond, riverine, wetland or ruderal/annual grassland or habitat. Surveys shall be conducted by qualified biologists in accordance with the most current CDFG/USFWS guidelines or protocols and shall be conducted during the blooming period of the plant species with potential to occur in the area, as listed in Table 4.4-2. If these surveys reveal no occurrences of any species, then no further mitigation would be required.
- 4.4-1(b) Should surveys determine that special-status plant species are present, measures will be taken to avoid the plants and the associated habitat necessary for long-term maintenance of the population. If avoidance is not feasible the campus will provide off-site compensation at a 1:1 ratio. Off-site compensation will include preservation of existing populations at other sites and/or enhancement of the affected species. The campus will preserve either an equal number of the affected plants or an equal area of the affected species habitat. The campus shall also develop and fund the implementation of a plan to manage and monitor the preserve to ensure the long-term survival of the preserved population.
- 4.4-4(a) The campus shall conduct a pre-construction survey of trees on and adjacent to a project site during the raptor breeding season (approximately March 1 to August 31). Additionally, the campus shall conduct surveys within a 1/2-mile radius of the site to determine the presence or absence of any nesting Swainson's hawks. The surveys shall be conducted by a qualified biologist during the same calendar year that the proposed activity is planned to begin to determine if any nesting birds-of-prey would be affected. If phased construction procedures are planned for the proposed activity, the results of the above

BIOLOGICAL RESOURCES

survey shall be valid only for the season when it is conducted.

If any Swainson's hawks are nesting within a one-half-mile radius of the project site or if other raptors are nesting in, on or adjacent to the project site, a qualified biologist shall determine the potential for disturbance to nesting raptors, including Swainson's hawks. If the biologist determines that there is a significant potential for disturbance, the campus shall implement feasible changes in the construction schedule or make other appropriate adjustments to the project in response to the specific circumstances. If feasible project changes are not readily identifiable, the campus will consult with CDFG to determine what actions should be taken to protect the nesting efforts. If, after five years, a previously recorded nest site remains unoccupied by a Swainson's hawk, it will no longer be considered as a Swainson's hawk nest site subject to this mitigation.

- 4.4-4(b) The campus shall continue to conduct annual surveys to determine the location of nesting Swainson's hawks and other birds of prey on the campus outside the Putah Creek corridor. If nesting Swainson's hawks are found during the survey at a previously unknown location within one-half mile of a project site and/or at a location closer to the project or more visually exposed to the project site than a nearby previously documented site, a qualified biologist shall, prior to project construction, determine the potential for disturbance to nesting Swainson's hawks. If the biologist determines that there is a significant potential for disturbance, the campus shall implement feasible changes in the construction schedule or make other appropriate adjustments to the project in response to the specific circumstances (e.g. relocating noisy equipment or creating temporary sound barriers).

The implementation of LRDP Mitigations 4.4-4(a) and (b) shall be conducted under the supervision of a biologist whose qualifications include:

- A bachelor's degree in biology or a related field;
- Two years of field experience related to nesting raptors; and
- Prior construction monitoring experience.

Further:

- All decisions of the qualified biologist shall be made in consultation with the California Department of Fish and Game;
- Monitoring shall be conducted for a sufficient time (minimum of 3 consecutive days following the initiation of construction) to verify that the nesting pair does not exhibit significant adverse reaction to construction activities (i.e., changes in behavioral patterns, reactions to construction noise, etc.); and
- Nest site monitoring will continue for a minimum of once a week through the nesting cycle at that nest.

- 4.4-5 Mitigation 4.4-4(a) and (b) will be implemented, including pre-construction survey of trees on and adjacent to a project site during the raptor breeding season (approximately March 1 to August 31). If a Swainson's hawk nest tree is present, the tree will be removed outside the nesting season (March-May).

- 4.4-8(a) During the project design phase, the campus shall conduct a wetlands delineation of the project site if wetlands are potentially present. The wetland delineation shall be verified by the ACOE. Should no wetland habitats or natural drainages be delineated on the site then no further mitigation shall be required. However, if any jurisdictional wetland habitats or natural drainages are delineated on a project site, then LRDP Mitigation 4.4-8(b) shall be required.

- 4.4-8(b) For projects that involve the fill of jurisdictional wetlands, the campus shall implement the following mitigation program that will ensure no net loss of wetland functions and values. To the extent feasible, the campus will avoid filling wetlands by redesigning the project to promote environmentally sensitive siting and design. If avoidance is not feasible, the campus shall minimize the fill acreage. If neither of these options is feasible, the wetlands will be mitigated for at a 3:1 ratio. This ratio will include both creation and preservation, with creation equaling at least a 1:1 ratio. To ensure no net loss of wetlands, the mitigation should include wetland enhancement as well. This would include monitoring, cleanup, and maintenance of preserved wetland habitats within and adjacent to the campus, as necessary.

- 4.4-8(c) The campus shall obtain the necessary ACOE, CDFG, and RWQCB permits prior to filling or other adverse modifications of any verified jurisdictional water of the U.S., or alteration, filling or modification of the channel,

2003 LRDP EIR Mitigation Measures

BIOLOGICAL RESOURCES

bed or bank of Putah Creek, South Fork of Putah Creek, Arboretum Waterway or any other natural drainage regulated under Section 1600 of the CDFG code.

- 4.4-11 Before a project is approved under the 2003 LRDP, the campus will perform a tree survey of the project site. Grounds, the Office of Resource Management and Planning, and the Office of Architects and Engineers will provide input about tree classifications and will modify project design to avoid important trees if feasible. If a project cannot avoid an important tree, the following will apply:
- a. If a project would necessitate removal of a Heritage Tree, no mitigation would be available to fully mitigate the impact, and the impact would be significant and unavoidable. However, implementation of Mitigation 4.4-2 would restore Valley Foothill Riparian Woodland habitat at Russell Ranch, and plantings in this area would include valley oaks.
 - b. If a project would necessitate removal of a Specimen Tree, the project would relocate the tree if feasible, or would replace the tree with the same species or species of comparable value (relocation or replacement should occur within the project area if feasible). This would reduce the impact to a less than significant level.

6.4.4 Environmental Checklist and Discussion

BIOLOGICAL RESOURCES	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...					
a) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) 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 US Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

BIOLOGICAL RESOURCES

Would the project...	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) **Plants**

The 2003 LRDP EIR found that development under the 2003 LRDP could result in the loss of special-status plant species (LRDP Impact 4.4-1). However, the analysis in the 2003 LRDP EIR concluded that urban habitat at UC Davis such as the Project site (which is either under buildings and roadways or under landscaping) has no potential to include special-status plant species. Accordingly, the Project sites do not provide suitable habitat for special-status plant species and would have no potential to affect special-status plant species; therefore, there would be no impact. See item (e) below for details related to removal of urban landscape trees.

Wildlife

The 2003 LRDP EIR found that development under the 2003 LRDP could affect several wildlife species, including burrowing owl, Swainson’s hawk, valley elderberry longhorn beetle (VELB), western pond turtle, and special-status fish species (LRDP Impacts 4.4-2 through 4.4-7 and 4.4-12 through 4.4-14). Under the Project, construction would be limited to previously developed sites within the central campus. The Project would redevelop the existing academic/administrative area that is surrounded by buildings, walkways, bicycle parking, and limited horticultural landscaping. The Project site does not contain any riparian areas or agricultural lands that were identified in Section 4.4 of the 2003 LRDP EIR as having potential for providing suitable habitat for special-status wildlife species. However, a very large mature elderberry shrub exists approximately 300-feet north of the northwestern portion of the site along Extension Center Drive. This shrub would not be impacted by the Project. For any future work on Extension Center drive it should be protected from construction equipment or staging areas by a 25-foot buffer. As no suitable habitat is present for burrowing owl, VELB, western pond turtle or special-status fish species on the site, there is no potential for impacts to these species or their habitat, as a result of Project implementation. According to the 2003 LRDP EIR there is low to no potential to encounter special-status bat species on the campus. No signs of bat activity (guano, urine stains, etc.) were detected during the biological reconnaissance survey conducted for the Project on July 24, 2017. Additionally, no suitable roosting habitat occurs for bats within either site. Because bats could potentially forage within the site, construction activities should be limited to daylight hours.

There are several recorded occurrences of nesting Swainson’s hawks within ½ mile of the project sites, and Swainson’s hawks could potentially nest in trees around the periphery of, or adjacent to the Project sites. Additionally, other native migratory birds species protected by the federal Migratory Bird Treaty Act could nest in trees or shrubs on or adjacent to the site. Implementation of LRDP Mitigation Measures 4.4-4(a)-(b) and 4.4-5 requires actions to ensure that active nests are not disturbed. Implementation of LRDP Mitigation Measures 4.4-4(a)-(b) and 4.4-5 would reduce potential impacts to nesting Swainson’s

hawks or other nesting birds to less than significant. This impact was adequately addressed in the 2003 LRDP EIR.

Impact 4.4-12 of the 2003 LRDP EIR concluded that growth in the City of Davis and Yolo and Solano counties would result in a significant and unavoidable cumulative loss of habitat for resident and migratory species. The continued loss of these habitat types around the campus and the City of Davis also would contribute to the regional loss of foraging habitat for the Swainson's hawks that may contribute to this species' decline in California. The burrowing owl also would be subject to a substantial loss of habitat as development occurs in the region. While Yolo County's Natural Communities Conservation Plan and Solano County's HCP would address impacts to biological resources and compensate for losses, UC Davis will compensate for habitat loss on campus by developing and implementing habitat mitigation on the UC Davis campus. The campus will therefore not contribute to this cumulative impact. However, the regional conversion of habitat around the campus, the City of Davis and throughout Yolo and Solano Counties to urban development is considered a substantial reduction in the acres of habitat for native wildlife. Implementation of the Yolo County NCCP and Solano County HCP may reduce these effects to a less-than-significant level. However, UC Davis cannot guarantee implementation; therefore, the impact remains significant and unavoidable.

The Project would include demolition of existing greenhouses on the Orchard Park Greenhouses site and construction of new greenhouses and structures within the existing footprint of the CORE 2 Greenhouses site. As discussed above, the Project would not impact suitable habitat for special-status species. Furthermore, cumulative growth in the region is consistent with that assumed in the 2003 LRDP EIR. This impact was adequately analyzed in the 2003 LRDP EIR and fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. Conditions have not substantially changed and no new information has become available since certification of the 2003 LRDP EIR that would alter this previous analysis.

b,c) The Orchard Park Greenhouses site has approximately 95 existing one-story buildings and greenhouses with paved walkways connecting the buildings and paved and gravel parking area interspersed between them. There are no riparian or wetland areas on the Project site. No impact would occur.

The Core 2 Project site has one large greenhouse in the eastern portion of the site and the rest is comprised of paved roads, agricultural research fields and disturbed bare ground. There are no riparian or wetland areas on the Project site. No impact would occur.

Impact 4.4-13 of the 2003 LRDP EIR concluded that growth in the City of Davis and other cities of Yolo and Solano counties could convert wetland and riparian habitat to urban uses, and that there could be a cumulative loss of habitat for resident and migratory wildlife species and special status plants. The most significant wetland features (waters of the U.S) on the campus are the Putah Creek and South Fork Putah Creek drainages, and the Arboretum Waterway. The only modifications of Putah Creek or South Fork of Putah Creek planned under the 2003 LRDP were drainage improvements and maintenance. The Arboretum Waterway may be subject to disturbance from drainage improvement projects, bank stabilization measures and landscape maintenance activities. UC Davis will compensate for habitat loss on campus by implementing the mitigation measures 4.4-1(a)-(b) to mitigate for impacts to special-status plants 4.4-8(a)-(c) ensure no net loss of wetland functions and values. No campus mitigation is required for impacts to migratory corridors. Implementation of the Yolo County NCCP and Solano County HCP may reduce these effects to a less-than-significant level. However, UC Davis cannot guarantee implementation; therefore, the impact remains significant and unavoidable.

As described above, there are no riparian or wetland areas on the Project site. Therefore, the Project would have no impact on cumulative loss of riparian or wetland features. Furthermore, cumulative growth in the region is consistent with that assumed in the 2003 LRDP EIR. This impact was adequately analyzed in the 2003 LRDP EIR and fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. Conditions have not substantially changed and no new information has become available since certification of the 2003 LRDP EIR that would alter this previous analysis.

d) The Putah Creek corridor, which is the southern boundary of the campus, is the principal corridor for the movement of native resident and migratory fish and wildlife through the UC Davis campus. It is the regional connection between the hills in western Yolo County and the Sacramento River. The Project site is 0.60 mile north of the Putah Creek corridor. Therefore, the Project would not 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. No impact would occur.

Impact 4.4-15 of the 2003 LRDP EIR concluded that development under the 2003 LRDP, in conjunction with other development in the region, would not result in significant cumulative impacts on special status fish species. As discussed above, the Project sites are approximately 0.60 mile north of the Putah Creek corridor. Therefore, the project would not interfere with the movement of any native resident or migratory fish or wildlife species. Because the Project is within the scope of development under the 2003 LRDP and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter this previous analysis.

e) The 2003 LRDP EIR evaluated the impact associated with the removal of significant trees in conjunction with the development of new buildings and facilities (LRDP Impact 4.4-11) and included Mitigation Measure 4.4-11 which requires that all project sites with trees be surveyed and the design of the Project be modified if the Project requires the removal of a heritage tree. The LRDP EIR concluded that in all instances, the removal of heritage trees would not be avoided by project design. The EIR therefore concluded that the implementation of LRDP Mitigation Measure 4.4-11 would not reduce the impact to less than significant, and LRDP Impact 4.4-11 was determined to be significant and unavoidable. Pursuant to LRDP Mitigation Measure 4.4-11, the campus performs a tree survey of a project site prior to project approval, and modifies the project design to the extent feasible to avoid tree removal or provide additional mitigation if removal of heritage or specimen trees cannot be avoided. As discussed in Section 7.4.1, both Project sites have mature trees along the boundaries of the sites; however, no trees will be removed under the project, therefore there would be no impact.

f) The campus does not fall within the boundaries of, nor is it adjacent to, an adopted regional Habitat Conservation Plan (HCP) or Natural Community Conservation Plan (NCCP). The campus has implemented two low effects HCPs for Valley Elderberry Longhorn Beetle at Russell Ranch. The Project is not located at Russell Ranch. Therefore, the Project would not conflict with an adopted HCP or NCCP.

6.5 CULTURAL RESOURCES

6.5.1 Background

Section 4.5 of the 2003 LRDP EIR addresses the effects of campus growth under the 2003 LRDP on cultural resources. The following discussion summarizes information presented in the ‘Setting’ subsection of Section 4.5 of the 2003 LRDP EIR.

Environmental Setting

Cultural resources on campus and in the surrounding area include prehistoric and historic resources. Prehistoric resources are those sites and artifacts associated with the indigenous, non-Euroamerican population, generally dating prior to contact with people of European descent. Historic resources include structures, features, artifacts, and sites that date from Euroamerican settlement of the region.

Archaeological Resources

The campus and surrounding area lies in the ethnographic territory of the Patwin. Since 1991, extensive archaeological investigations (survey, testing, monitoring, and/or excavation) have been conducted on campus in conjunction with the development of campus projects (Nadolski 2003). Patwin sites, including burials, have been identified at several locations on the central campus. Areas within 800 feet of the banks of the historic channel of Putah Creek and its tributaries and slough channels, and within 800 feet of specific known archaeological sites, have been identified as archaeologically sensitive zones on the campus. Within the City of Davis, studies for cultural and historic resources were completed at nine study sites of which resources were only discovered on two sites, Covell Center and Oeste Campus. Covell Center and Oeste campus are located 1.7 miles northeast and 1.3 miles northwest from the Project site, respectively.

Historic Resources

The earliest direct historic contacts in the Davis area probably occurred during 1806 to 1808. Farming on a large scale began in the Davis area in the 1850s. A “university farm” was established at Davis in 1906, classes began in 1909, and Davis became a general University of California campus in 1959. Temporary Building 9, which has been an art studio for decades, was recently included in the National Register of Historic Places and the California Register of Historical Resources. No other properties within the campus are listed in these registers. Six properties on or near the campus have been recorded with the California Inventory of Historic Resources. Historic architectural features typically must be at least 50 years of age to be considered for listing on the California Register of Historical Resources (CRHR).

Project Site

The Project site is located north of the historic channel of Putah Creek and outside of the Zone of Cultural Sensitivity around Putah Creek. The existing greenhouses that would be demolished on the Orchard Park Greenhouses site are less than 50 years old.

Consultation

Assembly Bill (AB) 52 establishes a consultation process, effective July 1, 2015, between California public agencies and California Native American Tribes. AB 52 further establishes a category of resources known as tribal cultural resources. At the outset of the CEQA process, public agencies must notify tribes that have requested such notice, of any project that has the potential to impact a tribal cultural resource. UC Davis has not received a request for notification from any of the local tribes. UC Davis notifies the Yocha Dehe of all projects, and provides an update two or three times per year. No consultation request regarding this Project has been made.

6.5.2 2003 LRDP EIR Standards of Significance

In addition to the following archaeological and historical standards of significance identified in the 2003 LRDP EIR, an additional standard from the CEQA Guidelines' Environmental Checklist ("c" in the checklist below) was found not applicable to campus growth under the 2003 LRDP.

Archaeological Resources

The 2003 LRDP EIR considers an impact on archaeological resources significant if growth under the 2003 LRDP would:

- Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to CEQA Guideline § 15064.5.
- Disturb any human remains, including those interred outside of formal cemeteries.

A "unique archaeological resource" is defined under CEQA through Public Resources Code (PRC) Section 21083.2(g). A unique archaeological resource implies an archaeological artifact, object, or site about which it can be clearly demonstrated that there is a high probability that it meets one of the following criteria:

- The archaeological artifact, object, or site contains information needed to answer important scientific questions and there is a demonstrable public interest in that information, or
- The archaeological artifact, object, or site has a special and particular quality, such as being the oldest of its type or the best available example of its type, or
- The archaeological artifact, object, or site is directly associated with a scientifically recognized important prehistoric or historic event or person.

For a resource to qualify as a unique archaeological resource, the agency must determine that there is a high probability that the resource meets one of these criteria without merely adding to the current body of knowledge (PRC § 21083.2(g)). An archaeological artifact, object, or site that does not meet the above criteria is a nonunique archaeological resource (PRC § 21083.2(h)). An impact on a nonunique resource is not a significant environmental impact under CEQA (CEQA Guidelines § 15064.5(c)(4)). If an archaeological resource qualifies as a historical resource under CRHR or other criteria, then the resource is treated as a historical resource for the purposes of CEQA (CEQA Guidelines § 15064.5(c)(2)).

Section 15064.5 of the CEQA Guidelines assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. These procedures are detailed under PRC § 5097.98. California Health and Safety Code § 7050.5(b) prohibits disturbance of human remains uncovered by excavation until the Coroner has made a finding relative to PRC § 5097 procedures.

Historical Resources

The 2003 LRDP EIR considers an impact on historic resources significant if growth under the 2003 LRDP would:

- Cause a significant adverse change in the significance of a historical resource as defined in CEQA Guidelines § 15064.5.

The standards of significance for historical resources are based on Appendix G and § 15064.5 of the CEQA Guidelines. Accordingly, historical resources include resources listed in, or determined to be eligible for listing in, the CRHR; resources included in a qualifying local register (such as the City of Davis Register of Historic Resources); and resources that the lead agency determines to meet the criteria for listing in the

CRHR. These criteria may apply to any historic built environmental feature, and to historic or prehistoric archaeological sites. Properties or sites that are eligible for inclusion in the CRHR are termed “historical resources.” Under the provisions of CEQA Guidelines § 15064.5(a)(3), generally a lead agency should find that a property is historically significant if it determines that the property meets one or more of the criteria for listing on the CRHR, which extend to any building, structure, feature or site that:

- Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
- Is associated with lives of persons important in our past;
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history.

With few exceptions, to qualify as a historical resource a property must be at least 50 years old and also must retain physical integrity and integrity to its period of significance. For historic structures and buildings, significantly altering the setting, remodeling, or moving the structure may diminish or destroy its integrity. However, under some conditions, a building that has been moved or altered may still retain its historic significance. Landscaping or landscape features may, in some cases, contribute to the significance of an historic architectural property. Such elements would be assessed as part of the evaluation of the related historic architectural property.

Archaeological sites may also qualify as historical resources under CEQA Guideline Section 15064.5(a)(3). Archaeological sites most often are assessed relative to CRHR Criterion D (for potential to yield data important to history or prehistory). An archaeological deposit that has been extensively disturbed and archaeological artifacts found in isolation may not be eligible for listing on the CRHR, because the lack of stratigraphic context may reduce the potential for the resource to yield significant data. A resource that does not meet one of the criteria for eligibility to the CRHR is not a historical resource under CEQA, and impacts to such a property are not significant.

6.5.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP on cultural resources are evaluated in Section 4.5 of the 2003 LRDP EIR. The Project is within the scope of analysis in the 2003 LRDP EIR and significant and potentially significant cultural resources impacts identified in the 2003 LRDP EIR that are relevant to the Project are presented below with their corresponding levels of significance before and after application of mitigation measures identified in the 2003 LRDP EIR.

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
CULTURAL RESOURCES			
4.5-4	Implementation of the 2003 LRDP could disturb human remains, including those interred outside of formal cemeteries.	PS	LS
4.5-5	Development under the 2003 LRDP would contribute to cumulative damage to and loss of the resource base of unique archeological resources and historical resources (including archeological sites and historic buildings and structures) in Yolo and Solano counties.	S	SU

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

Mitigation measures in the 2003 LRDP EIR that are applicable to the Project are presented below. Since these mitigation measures are already being carried out as part of implementation of the 2003 LRDP, they are considered part of the Project description and will not be readopted in this Initial Study or Negative Declaration. Nothing in this Initial Study in any way alters the obligations of the campus to implement 2003 LRDP EIR mitigation measures.

2003 LRDP EIR Mitigation Measures

CULTURAL RESOURCES

- 4.5-1(a) As early as possible in the project planning process, the campus shall define the project's area of potential effects (APE) for archaeological resources and, if structures are present on the site, for historic structures. The campus shall determine the potential for the project to result in cultural resource impacts, based on the extent of ground disturbance and site modification anticipated for the Project. Based on this information, the campus shall:
- (i) Prepare an inventory of all buildings and structures within the APE that will be 50 years of age or older at the time of project construction for review by a qualified architectural historian. If no structures are present on the site, there would be no impact to historic built environment resources from the project. If potentially historic structures are present, LRDP Mitigation 4.5-1(c) shall be implemented.
 - (ii) Determine the level of archaeological investigation that is appropriate for the project site and activity, as follows:
 - Minimum: excavation less than 18 inches deep and in a relatively small area (e.g., a trench for lawn irrigation, tree planting, etc.). Implement LRDP Mitigation 4.5-1(b)(i).
 - Moderate: excavation below 18 inches deep and/or over a large area on any site that has not been characterized and is not suspected to be a likely location for archaeological resources. Implement LRDP Mitigation 4.5-1 (b)(i) and (ii).
 - Intensive: excavation below 18 inches and/or over a large area on any site that is within 800 feet of the historic alignment of Putah Creek, or that is adjacent to a recorded archaeological site. Implement LRDP Mitigation 4.5-1 (i), (ii) and (iii).
- 4.5-1(b) During the planning phase of the project, the campus shall implement the following steps to identify and protect archaeological resources that may be present in the APE:
- (i) For project sites at all levels of investigation, contractor crews shall be required to attend an informal training session prior to the start of earth moving, regarding how to recognize archaeological sites and artifacts. In addition, campus employees whose work routinely involves disturbing the soil shall be informed how to recognize evidence of potential archaeological sites and artifacts. Prior to disturbing the soil, contractors shall be notified that they are required to watch for potential archaeological sites and artifacts and to notify the campus if any are found. In the event of a find, the campus shall implement item (vi), below.
 - (ii) For project sites requiring a moderate or intensive level of investigation, a surface survey shall be conducted by a qualified archaeologist during project planning and design and prior to soil disturbing activities. For sites requiring moderate investigation, in the event of a surface find, intensive investigation will be implemented, as per item (iii), below. Irrespective of findings, the qualified archaeologist shall, in consultation with the campus, develop an archaeological monitoring plan to be implemented during the construction phase of the project. The frequency and duration of monitoring shall be adjusted in accordance with survey results, the nature of construction activities, and results during the monitoring period. In the event of a discovery, the campus shall implement item (vi), below.
 - (iii) For project sites requiring intensive investigation, irrespective of subsurface finds, the campus shall retain a qualified archaeologist to conduct a subsurface investigation of the project site, to ascertain whether buried archaeological materials are present and, if so, the extent of the deposit relative to the project's area of potential effects. If an archaeological deposit is discovered, the archaeologist will prepare a site record and file it with the California Historical Resource Information System.
 - (iv) If it is determined through step (iii), above, that the resource extends into the project's area of potential effects, the resource will be evaluated by a qualified archaeologist, who will determine whether it qualifies as a historical resource or a unique archaeological resource under the criteria of CEQA Guidelines § 15064.5. If the resource does not qualify, or if no resource is present within the project area of potential effects (APE), this will be noted in the environmental document and no further mitigation is required unless

2003 LRDP EIR Mitigation Measures

CULTURAL RESOURCES

there is a discovery during construction (see (vi), below).

- (v) If a resource within the project APE is determined to qualify as an historical resource or a unique archaeological resource (as defined by CEQA), the campus shall consult with the qualified archaeologist to consider means of avoiding or reducing ground disturbance within the site boundaries, including minor modifications of building footprint, landscape modification, the placement of protective fill, the establishment of a preservation easement, or other means that will permit avoidance or substantial preservation in place of the resource. If avoidance or substantial preservation in place is not possible, the campus shall implement LRDP Mitigation 4.5-2(a).
 - (vi) If a resource is discovered during construction (whether or not an archaeologist is present), all soil disturbing work within 100 feet of the find shall cease. The campus shall contact a qualified archaeologist to provide and implement a plan for survey, subsurface 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. LRDP Mitigation 4.5-1(b), steps (iii) through (vii) shall be implemented.
 - (vii) A written report of the results of investigations will be prepared by a qualified archaeologist and filed with the appropriate Information Center of the California Historical Resources Information System.
- 4.5-1(c) (i) Before altering or otherwise affecting a building or structure 50 years old or older, the campus shall retain a qualified architectural historian to record it on a California Department of Parks and Recreation DPR 523 form or equivalent documentation. Its significance shall be assessed by a qualified architectural historian, using the significance criteria set forth for historic resources under CEQA Guidelines Section 15064.5. The evaluation process shall include the development of appropriate historical background research as context for the assessment of the significance of the structure in the history of the University system, the campus, and the region. For historic buildings, structures or features that do not meet the CEQA criteria for historical resource, no further mitigation is required and the impact is less than significant.
- (ii) For a building or structure that qualifies as a historic resource, the architectural historian and the campus shall consult to consider measures that would enable the project to avoid direct or indirect impacts to the building or structure. These could include preserving a building on the margin of the project site, using it “as is,” or other measures that would not alter the building. If the project cannot avoid modifications to a significant building or structure, the campus shall implement LRDP Mitigation 4.5-2.
- 4.5-2(a) For an archaeological site that has been determined by a qualified archaeologist to qualify as an historical resource or a unique archaeological resource through the process set forth under LRDP Mitigation 4.5-1(b), and where it has been determined under LRDP Mitigation 4.5-1(b) that avoidance or preservation in place is not feasible, a qualified archaeologist, in consultation with the campus, shall:
- (i) Prepare a research design and archaeological data recovery plan for the recovery that will capture those categories of data for which the site is significant, and implement the data recovery plan prior to or during development of the site.
- (ii) Perform appropriate technical analyses, prepare a full written report and file it with the appropriate information center, and provide for the permanent curation of recovered materials.
- (iii) If, in the opinion of the qualified archaeologist and in light of the data available, the significance of the site is such that data recovery cannot capture the values that qualify the site for inclusion on the CRHR, the campus shall reconsider project plans in light of the high value of the resource, and implement more substantial modifications to the proposed project that would allow the site to be preserved intact, such as project redesign, placement of fill, or project relocation or abandonment. If no such measures are feasible, the campus shall implement LRDP Mitigation 4.5-3.
- 4.5-2(b) For a structure or building that has been determined by a qualified architectural historian to qualify as an historical resource through the process set forth under LRDP Mitigation 4.5-1(c), and where it has been determined under LRDP Mitigation 4.5-1(c) that avoidance is not feasible, documentation and treatment shall be carried out as described below:
- (i) If the building or structure can be preserved on site, but remodeling, renovation or other alterations are required, this work shall be conducted in compliance with the “Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings” (Weeks and Grimmer 1995).

2003 LRDP EIR Mitigation Measures

CULTURAL RESOURCES

- (ii) If a significant historic building or structure is proposed for major alteration or renovation, or to be moved and/or demolished, the campus shall ensure that a qualified architectural historian thoroughly documents the building and associated landscaping and setting. Documentation shall include still and video photography and a written documentary record of the building to the standards of the Historic American Building Survey (HABS) or Historic American Engineering Record (HAER), including accurate scaled mapping, architectural descriptions, and scaled architectural plans, if available. A copy of the record shall be deposited with the University archives, Shields Library Special Collections. The record shall be accompanied by a report containing site-specific history and appropriate contextual information. This information shall be gathered through site specific and comparative archival research, and oral history collection as appropriate.
- (iii) If preservation and reuse at the site are not feasible, the historical building shall be documented as described in item (ii) and, when physically and financially feasible, be moved and preserved or reused.
- (iv) If, in the opinion of the qualified architectural historian, the nature and significance of the building is such that its demolition or destruction cannot be fully mitigated through documentation, the campus shall reconsider project plans in light of the high value of the resource, and implement more substantial modifications to the proposed project that would allow the structure to be preserved intact. These could include project redesign, relocation or abandonment. If no such measures are feasible, the campus shall implement LRDP Mitigation 4.5-3.
- 4.5-3 If a significant historic resource or unique archaeological resource cannot be preserved intact, before the property is damaged or destroyed the campus shall ensure that the resource is appropriately documented, as follows.
- (i) For a built environment feature, appropriate documentation is described under LRDP 4.5-2 (b) (iii).
- (ii) For an archaeological site, a program of research-directed data recovery shall be conducted and reported, consistent with LRDP Mitigation 4.5-2(a).
- 4.5-4(a) Implement LRDP Mitigation 4.5-1, 4.5-2 and 4.5-3 to minimize the potential for disturbance or destruction of human remains in an archaeological context and to preserve them in place, if feasible.
- 4.5-4(b) Provide a representative of the local Native American community an opportunity to monitor any excavation (including archaeological excavation) within the boundaries of a known Native American archaeological site.
- 4.5-4(c) In the event of a discovery on campus of human bone, suspected human bone, or a burial, all excavation in the vicinity will halt immediately and the area of the find will be protected until a qualified archaeologist determines whether the bone is human. If the qualified archaeologist determines the bone is human, or if a qualified archaeologist is not present, the campus will notify the Yolo or Solano County Coroner (depending on the county of the find) of the find before additional disturbance occurs. Consistent with California Health and Safety Code § 7050.5(b), which prohibits disturbance of human remains uncovered by excavation until the Coroner has made a finding relative to PRC 5097 procedures, the campus will ensure that the remains and vicinity of the find are protected against further disturbance. If it is determined that the find is of Native American origin, the campus will comply with the provisions of PRC § 5097.98 regarding identification and involvement of the Native American Most Likely Descendant (MLD).
- 4.5-4(d) If human remains cannot be left in place, the campus shall ensure that the qualified archaeologist and the MLD are provided opportunity to confer on archaeological treatment of human remains, and that appropriate studies, as identified through this consultation, are carried out prior to reinterment. The campus shall provide results of all such studies to the local Native American community, and shall provide an opportunity of local Native American involvement in any interpretative reporting. As stipulated by the provisions of the California Native American Graves Protection and Repatriation Act, the campus shall ensure that human remains and associated artifacts recovered from campus projects on state lands are repatriated to the appropriate local tribal group if requested.
- 5.5-5 Implement LRDP Mitigations 4.5-1 through 4.5-4.
-

6.5.4 Environmental Checklist and Discussion

CULTURAL RESOURCES		Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...						
a)	Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d)	Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

a) The Project sites contain no resources that would qualify as historic. The CORE 2 Project site primarily consists of vacant agricultural research/teaching fields, and includes one greenhouse building. The Orchard Park Greenhouses site contains greenhouse buildings and support structures that would be removed as part of the proposed Project. All buildings on both sites are less than 50 years old and do not embody any distinctive characteristics of a type, period, region, or method of construction; represent the work of an important creative individual; possess high artistic values; or have the potential to yield information important in history. There would be no impact on a historic resource.

The 2003 LRDP EIR identified that development under the 2003 LRDP would contribute to the cumulative damage to and loss of historical resources in Yolo and Solano counties (LRDP Impact 4.5-5). UC Davis cultural resources protocols, as stipulated in LRDP EIR Mitigation Measures 4.5-1 through 4.5-4, minimize the impact of development under the 2003 LRDP on unique historical resources, because the campus carries out a continuing program of archaeological investigation, which in most cases enables the campus to avoid or preserve unique historical resources, and appropriately recover data from and document resources that cannot be preserved in place. The campus mitigation program has proven effective in preventing or mitigating damage to historical resources; therefore, the mitigation program is considered to have reduced the campus impacts to less-than-significant levels in all cases to date. However, because there are no measures that can fully mitigate this impact, and because UC Davis cannot guarantee implementation by other agencies of measures to protect historical resources, this cumulative impact is considered significant and unavoidable.

As described above, the Project sites do not include historic architectural resources and would not contribute to cumulative impacts on historic resources. This impact was adequately analyzed in the 2003 LRDP EIR and was fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. Conditions have not substantially changed and no new information has become available since certification of the 2003 LRDP EIR that would alter this previous analysis or conclusion.

b) The CORE 2 Project site contains disturbed agricultural research/teaching fields, and includes one greenhouse building. The Orchard Park Greenhouses site is developed with greenhouse buildings and support structures. Moderate excavation associated with proposed Project construction has the potential to uncover archaeological resources in previously undisturbed soils. Pursuant to LRDP Mitigation 4.5-1(a),

University consultants conducted a site investigation (Pacific Legacy 2017). Although no cultural materials were identified during geocoring and auger testing, the site is considered sensitive. Therefore, construction monitoring per LRDP Mitigation Measure 4.5-1(b), shall be implemented as part of the Project. Implementation of LRDP mitigation measures would reduce the potential Project impact to less than significant.

The 2003 LRDP EIR identified that development under the 2003 LRDP would contribute to the cumulative damage to and loss of archeological resources in Yolo and Solano counties (LRDP Impact 4.5-5). UC Davis cultural resources protocols, as stipulated in LRDP EIR Mitigation Measures 4.5-1 through 4.5-4, minimize the impact of development under the 2003 LRDP on unique archeological resources, because the campus carries out a continuing program of archaeological investigation, which in most cases enables the campus to avoid or preserve unique archeological resources, and appropriately recover data from and document resources that cannot be preserved in place. The campus mitigation program has proven effective in preventing or mitigating damage to archeological resources; therefore, the mitigation program is considered to have reduced the campus impacts to less-than-significant levels in all cases to date. However, because there are no measures that can fully mitigate this impact, and because UC Davis cannot guarantee implementation by other agencies of measures to protect archeological resources, this cumulative impact is considered significant and unavoidable.

Because any disturbance of native soils involves the potential to result in impacts to archaeological resources, the Project could contribute to this impact. LRDP Mitigation Measure 4.5-1, as required by LRDP Mitigation Measure 4.5-5, which is relevant to the Project, requires the campus to implement the measures discussed above to survey and protect cultural resources, which would reduce the Project's contribution to the cumulative impact to be cumulatively not considerable. Furthermore, this impact was adequately analyzed in the 2003 LRDP EIR and was fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. Conditions have not substantially changed and no new information has become available since certification of the 2003 LRDP EIR that would alter this previous analysis or conclusion.

c) During the course of development at UC Davis, extensive excavations for buildings and infrastructure, and extensive agricultural operations have not revealed the presence of unique paleontological or geological resources. It appears that the campus lacks unique paleontological and geological resources due to the deep alluvial deposition of fairly uniform soil types in the area. No impact would occur.

d) The 2003 LRDP EIR found the potential for development under the 2003 LRDP to disturb human remains, including those interred outside of formal cemeteries (LRDP Impact 4.5-4). LRDP Mitigation 4.5-4(a-d), included in the Project, would ensure that human remains in archaeological and isolated contexts would be protected from destruction that might take place from development through measures including identification, Native American consultation, preservation in place or recovery, respectful treatment and study, and reinternment. Therefore, this impact would be less than significant.

6.6 GEOLOGY, SOILS, AND SEISMICITY

6.6.1 Background

Section 4.6 of the 2003 LRDP EIR addresses the geology, soils, and seismicity effects of campus growth under the 2003 LRDP. The following discussion summarizes information presented in the 'Setting' subsection of Section 4.6 of the 2003 LRDP EIR.

Environmental Setting

The campus is located within the Putah Creek Plain of California's Great Valley geomorphic province. Except for the somewhat raised elevation along the levee adjacent to Putah Creek, the campus and surrounding area is topographically flat. Soils on campus and in the vicinity generally contain a high amount of silt and clay, and as a result, are moderately to slowly permeable and have slow runoff rates, minimal erosion hazards, and moderate to high shrink-swell potential (the potential for soil volume to change with a loss or gain in moisture). The predominant soil constraint to construction on the campus is the soil's shrink-swell potential.

A series of low foothills, including the Dunnigan Hills, the Capay Hills, and the English Hills, lie approximately 20 miles west of the campus at the eastern base of the Coast Range. The presence of subsurface thrust faults within these regional foothills and within 100 miles of the campus indicates the potential for seismic ground shaking in the Davis region. The Davis region is not located within an Alquist-Priolo Fault Zone as defined in the Alquist-Priolo Earthquake Fault Zoning Act, which is designed to prohibit the construction of structures for human occupancy across active faults. According to the California Geological Survey's Probabilistic Seismic Hazard Assessment for the State of California, the peak ground acceleration with a 10 percent probability of being exceeded in 50 years is 0.280g at the Project site (CDC 2008). By comparison, in most parts of the San Francisco Bay Area, the peak ground acceleration is 0.5g or greater. Likely effects of ground shaking during a probable maximum intensity earthquake for the area could include structural damage to stucco, masonry walls, and chimneys, which could expose people to risks associated with falling objects and potential building collapse.

Project Site

The nearest faults mapped near the Project site are the Dunnigan Hills and Vaca faults located approximately 15 miles north and 17 miles southwest, respectively (CDC 2010). The CORE 2 Project site and the Orchard Park Greenhouses site are underlain by moderately slow to moderately rapid permeable soils with very slow runoff rates, minimal erosion hazards, and moderate to high shrink-swell potential.

6.6.2 2003 LRDP EIR Standards of Significance

The 2003 LRDP EIR considers an impact related to geology, soils, and seismicity significant if growth under the 2003 LRDP would:

- Expose people or structures to potential substantial adverse effects involving strong seismic ground shaking.
- Expose people or structures to potential substantial adverse effects involving seismic-related ground failure.
- Result in substantial soil erosion or the loss of topsoil. (Impacts associated with the effect of erosion on water quality are addressed in Section 7.9 Hydrology & Water Quality.)
- 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 offsite landslide, lateral spreading, subsidence, liquefaction, or collapse.
- Be located on expansive soil, creating substantial risks to life or property.
- 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.

Additional standards from the CEQA Guidelines' Environmental Checklist (a,i) and (a,iv) in the checklist below) were found not applicable to campus growth under the 2003 LRDP.

6.6.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP related to geology, soils, and seismicity are evaluated in Section 4.6 of the 2003 LRDP EIR. As discussed in Section 7.6.4, below, the Project would not result in impacts related to geology, soils, and seismicity. For this reason, any mitigation measures identified in the 2003 LRDP EIR are not relevant to the Project.

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
GEOLOGY, SOILS, & SEISMICITY			
4.6-5	Cumulative development, including the development on campus under the 2003 LRDP, could expose people or structures to potential adverse effects involving seismic ground shaking.	LS	LS

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

6.6.4 Environmental Checklist and Discussion

GEOLOGY, SOILS, & SEISMICITY					
Would the project...	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) 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.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

GEOLOGY, SOILS, & SEISMICITY	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...					
substantial risks to life or property?					
e) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a,i) The UC Davis campus and the surrounding area, including the Project site, are not located within an Alquist-Priolo Earthquake Fault Zone. The closest known active fault rupture zones are over 30 miles away. Therefore, no impact would occur from rupture of a known Alquist-Priolo earthquake fault zone.

a,ii) The campus is located in a seismically active area that could experience ground shaking, liquefaction, and settlement. Significant magnitude earthquakes from the nearby faults, or other larger, but more distant faults to the west could generate moderate ground shaking at the Project site. The peak ground acceleration for the Project site is estimated to be 0.280g. This intensity of seismic groundshaking has the potential to dislodge objects from shelves and to damage or destroy buildings and other structures. In the case of such a seismic event, people on the Project site and in the area would be exposed to these hazards.

University projects must follow the seismic provisions of the California Building Code (CBC). Compliance is ensured through review by the Division of the State Architect. In addition, the Project must comply with University of California Seismic Safety Policy. These existing requirements would address potential seismic issues and the impact would be less than significant.

a,iii) See the discussion in item (c) below.

a,iv) The UC Davis campus and the surrounding area, including the Project site, are characterized by flat topography and therefore would not be subject to landslides. No impact would occur.

b) The soil types that occur on the Project sites generally contain a high amount of silt and clay, and these soil types have minimal erosion hazard associated with them (see pages 4.6-1, 2 and Figure 4.6-1 of the 2003 LRDP EIR). Therefore, this impact was determined to be less than significant in the 2003 LRDP EIR. The relationship between receiving water quality and potential soil erosion as a result of construction activities is addressed in items (a) and (c) in Section 7.9 Hydrology & Water Quality.

c) The potential for liquefaction on the campus is generally low because the depth to groundwater is relatively large (30 to 80 feet, depending on the season). Furthermore, as discussed above under item (a,ii), campus policy requires compliance with the CBC and the University of California Seismic Safety Policy, which include structural and nonstructural seismic safety provisions. Therefore, because the Project would comply with the CBC and the University of California Seismic Safety Policy, impacts associated with seismic-related ground failure would be less than significant.

d) The soils in several areas of the campus and near campus have high shrink/swell potential and on a site-specific basis could have the potential to create risk to life or property. Campus policy requires compliance with the CBC, which includes provisions for construction on expansive soils such as proper fill selection, moisture control, and compaction during construction. The Project would comply with the CBC, which would ensure that this impact is less than significant.

e) The 2003 LRDP EIR identifies that an impact would result if soils are incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems. No septic tanks or alternative wastewater disposal systems are included in the Project, and there would be no impact.

Cumulative Impacts

Impact 4.6-5 of the 2003 LRDP EIR concluded that development under the 2003 LRDP, in conjunction with other development in the region, would not result in significant cumulative impacts related to geology, soils, and seismicity. The campus minimizes hazards associated with damage or destruction to buildings and other structures by reviewing and approving all draft building plans for compliance with the California Building Code (CBC). The CBC (Title 24 California Code of Regulations) identifies the minimum standards for structural design and construction in California, including specific requirements for seismic safety. The campus also adheres to the University of California Seismic Safety Policy, which requires compliance with the provisions of the CBC and anchorage for seismic resistance of nonstructural building elements such as furnishings, fixtures, material storage facilities, and utilities that could create a hazard if dislodged during an earthquake. Because the Project is within the scope of development under the 2003 LRDP and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter this previous analysis or conclusion.

6.7 GREENHOUSE GAS EMISSIONS

This section discusses the existing conditions related to greenhouse gases (GHGs) and global climate change and evaluates the potential impacts from implementation of the Project. This section also provides a brief discussion of the applicable federal, state, regional, and local agencies that regulate, monitor, and control GHG emissions. The analysis in this Initial Study finds that the Project would result in less than significant GHG impacts.

The following sources were used to prepare this section of the Initial Study:

- UC Davis 2003 Long Range Development Plan (2003 LRDP)
- YSAQMD's Handbook for Assessing and Mitigating Air Quality Impacts
- CalEEMod version 2016.3.1
- The UC Davis 2009-2010 Climate Action Plan

6.7.1 Environmental Setting

Background

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind, lasting for an extended period (decades or longer). Gases that trap heat in the atmosphere are often called GHGs. The greenhouse effect traps heat in the troposphere through a threefold process: (1) short-wave radiation emitted by the Sun is absorbed by the Earth; (2) the Earth emits a portion of this energy in the form of long-wave radiation; and (3) GHGs in the upper atmosphere absorb this long-wave radiation and emit this long-wave radiation into space and back toward the Earth. This trapping of the long-wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

Principal GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide, O₃, and water vapor. Some GHGs, such as CO₂, CH₄, and nitrous oxide, occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO₂ and CH₄ are emitted in the greatest quantities from human activities. Emissions of CO₂ are largely byproducts of fossil-fuel combustion, whereas CH₄

results mostly from off-gassing associated with agricultural practices and landfills. Manufactured GHGs, which have a much greater heat-absorption potential than CO₂, include fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride, which are associated with certain industrial products and processes (CAT 2006).

The Intergovernmental Panel on Climate Change (IPCC) developed the Global Warming Potential (GWP) concept to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP of a GHG is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kilogram of a trace substance relative to that of 1 kilogram of a reference gas (IPCC 2007). The reference gas used is CO₂; therefore, GWP-weighted emissions are measured in metric tons of CO₂ equivalent (MT CO₂E).

Contributions to Greenhouse Gas Emissions

United States Emissions

Per the EPA’s *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2015* (EPA 2017b), total United States GHG emissions were approximately 6,586.7 million metric tons (MMT) CO₂E in 2015. The primary GHG emitted by human activities in the United States was CO₂, which represented approximately 82.2% of total GHG emissions (5,411.4 MMT CO₂E). The largest source of CO₂, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 93.3% of CO₂ emissions in 2015 (5,049.8 MMT CO₂E). Relative to 1990, gross United States GHG emissions in 2015 were higher by 3.5%; down from a high of 15.5% above 1990 levels in 2007. GHG emissions decreased from 2014 to 2015 by 2.3% (153.0 MMT CO₂E), and overall, net emissions in 2015 were 11.5% below 2005 levels (EPA 2017b).

State of California Emissions

According to California’s 2000–2015 GHG emissions inventory (2017 edition), California emitted 440.36 MMT CO₂E in 2015, including emissions resulting from out-of-state electrical generation (CARB 2017a). The sources of GHG emissions in California include transportation, industrial uses, electric power production from both in-state and out-of-state sources, commercial and residential uses, agriculture, high global-warming potential substances, and recycling and waste. The California GHG emission source categories (as defined in CARB’s 2008 Scoping Plan) and their relative contributions in 2015 are presented in **Table 7-3, Annual GHG Emissions in California**.

**Table 7-3
Annual GHG Emissions in California**

Source Category	Annual GHG Emissions (MMT CO ₂ E)	Percent of Total ^a
Transportation	164.63	37%
Industrial ^b	91.71	21%
Electric power ^c	83.67	19%
Commercial and residential	37.92	9%
Agriculture	34.65	8%
High global-warming potential substances	19.05	4%
Recycling and waste	8.73	2%
Total	440.36	100%

Source: CARB 2017a.

Notes: Emissions reflect the 2015 California GHG inventory.

MMT CO₂E = million metric tons of carbon dioxide equivalent per year

^a Percentage of total has been rounded, and total may not sum due to rounding.

- ^b The Aliso Canyon natural gas leak event released 1.96 MMT CO₂E of unanticipated emissions in 2015 and 0.52 MMT CO₂E in 2016. These leak emissions will be fully mitigated according to legal settlement and are tracked separately from routine inventory emissions.
- ^c Includes emissions associated with imported electricity, which account for 33.74 MMT CO₂E annually.

During the 2000 to 2015 period, per capita GHG emissions in California have continued to drop from a peak in 2001 of 14.0 MT per person to 11.3 MT per person in 2015, representing a 19% decrease. In addition, total GHG emissions in 2015 were approximately 1.5 MMT CO₂E less than 2014 emissions. The declining trend in GHG emissions, coupled with programs that will continue to provide additional GHG reductions going forward, demonstrates that California is on track to meet the 2020 target of 431 MMT CO₂E (CARB 2017a).

6.7.2 Regulatory Considerations

Federal

Massachusetts v. EPA. In *Massachusetts v. EPA* (April 2007), the U.S. Supreme Court directed the EPA administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In December 2009, the administrator signed a final rule with the following two distinct findings regarding GHGs under Section 202(a) of the federal Clean Air Act:

- The Administrator found that elevated concentrations of GHGs—CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆—in the atmosphere threaten the public health and welfare of current and future generations. This is the “endangerment finding.”
- The Administrator further found the combined emissions of GHGs—CO₂, CH₄, N₂O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is the “cause or contribute finding.”

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the Clean Air Act.

Energy Independence and Security Act of 2007. The Energy Independence and Security Act of 2007 (December 2007), among other key measures, would do the following, which would aid in the reduction of national GHG emissions:

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020, and directs National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy-efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Federal Vehicle Standards. In response to the U.S. Supreme Court ruling discussed above, the Bush Administration issued EO 13432 in 2007 directing the EPA, the Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the NHTSA issued a final rule regulating fuel efficiency

and GHG emissions from cars and light-duty trucks for model year 2011, and in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016.

In 2010, President Barack Obama issued a memorandum directing the Department of Transportation, Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards projected to achieve 163 grams per mile of CO₂ in model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021, and NHTSA intends to set standards for model years 2022–2025 in a future rulemaking. On January 12, 2017, the EPA finalized its decision to maintain the current GHG emissions standards for model years 2022–2025 cars and light trucks (EPA 2017c).

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014–2018. The standards for CO₂ emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6%–23% over the 2010 baselines.

In August 2016, the EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. The final standards are expected to lower CO₂ emissions by approximately 1.1 billion MT and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program (EPA and NHTSA 2016).

State

The following text summarizes key state laws and regulations related to GHG emissions.

Executive Order S-3-05. In 2005, in recognition of California’s vulnerability to the effects of climate change, Governor Schwarzenegger established Executive Order (EO) S-3-05, which set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80% below 1990 levels.

EO S-3-05 also directed the CalEPA to report biannually on progress made toward meeting the GHG targets and the impacts to California due to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. The Climate Action Team was formed, which subsequently issued reports from 2006 to 2010 (CAT 2017).

California Code of Regulations - Title 24. Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California’s building standards. While not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically established Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are

reviewed every few years by the Building Standards Commission and the California Energy Commission (CEC) (and revised if necessary) (California Public Resources Code, Section 25402[b][1]). The regulations receive input from members of industry, as well as the public, with the goal of “reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy” (California Public Resources Code, Section 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (California Public Resources Code, Section 25402[d]) and cost effectiveness (California Public Resources Code, Sections 25402[b][2] and [b][3]). As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment.

The current Title 24 standards are the 2016 Title 24 building energy efficiency standards, which became effective January 1, 2017. The updated standards will further reduce energy used and associated GHG emissions compared to previous standards, such as the 2013 Title 24 standards. In general, single-family homes built to the 2016 standards are anticipated to use about 28% less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards, and nonresidential buildings built to the 2016 standards will use an estimated 5% less energy than those built to the 2013 standards (CEC 2015).

In addition to the CEC’s efforts, in 2008, the California Building Standards Commission adopted the nation’s first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as CALGreen, and establishes minimum mandatory standards as well as voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential and state-owned buildings and schools and hospitals. The CALGreen 2016 standards became effective January 1, 2017. The mandatory standards require the following (24 CCR Part 11):

- Mandatory reduction in indoor water use through compliance with specified flow rates for plumbing fixtures and fittings
- Mandatory reduction in outdoor water use through compliance with a local water efficient landscaping ordinance or the California Department of Water Resources’ Model Water Efficient Landscape Ordinance
- 65% of construction and demolition waste must be diverted from landfills
- Mandatory inspections of energy systems to ensure optimal working efficiency
- Inclusion of electric vehicle charging stations or designated spaces capable of supporting future charging stations
- Low-pollutant emitting exterior and interior finish materials, such as paints, carpets, vinyl flooring, and particle boards

The CALGreen standards also include voluntary efficiency measures that are provided at two separate tiers and implemented at the discretion of local agencies and applicants. CALGreen’s Tier 1 standards call for a 15% improvement in energy requirements, stricter water conservation, 65% diversion of construction and demolition waste, 10% recycled content in building materials, 20% permeable paving, 20% cement reduction, and cool/solar-reflective roofs. CALGreen’s more rigorous Tier 2 standards call for a 30% improvement in energy requirements, stricter water conservation, 80% diversion of construction and

demolition waste, 15% recycled content in building materials, 30% permeable paving, 25% cement reduction, and cool/solar-reflective roofs.

The California Public Utilities Commission (CPUC), CEC, and CARB also have a shared, established goal of achieving zero net energy performance for new construction in California. The key policy timelines include (1) all new residential construction in California will be zero net energy by 2020, and (2) all new commercial construction in California will be zero net energy by 2030.

Assembly Bill 32. In furtherance of the goals established in EO S-3-05, the Legislature enacted AB 32 (Núñez and Pavley). The bill is referred to as the California Global Warming Solutions Act of 2006 (September 27, 2006). AB 32 provided initial direction on creating a comprehensive multiyear program to limit California's GHG emissions at 1990 levels by 2020 and initiate the transformations required to achieve the state's long-range climate objectives.

Senate Bill 375. SB 375 (Steinberg) (September 2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 requires CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035 and to update those targets every 8 years. SB 375 requires the state's 18 regional metropolitan planning organizations to prepare a Sustainable Communities Strategy (SCS) as part of their Regional Transportation Plan (RTP) that will achieve the GHG reduction targets set by CARB. If a metropolitan planning organization is unable to devise an SCS to achieve the GHG reduction target, the metropolitan planning organization must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

Senate Bill 32 and Assembly Bill 197. Senate Bill (SB) 32 and AB 197 (enacted in 2016) are companion bills. SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, in order to provide ongoing oversight over implementation of the state's climate policies. AB 197 also added two members of the Legislature to the Board as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and TACs from reporting facilities; and requires CARB to identify specific information for GHG emissions reduction measures when updating the scoping plan.

CARB's 2007 Statewide Limit. In 2007, in accordance with California Health and Safety Code, Section 38550, CARB approved a statewide limit on the GHG emissions level for year 2020 consistent with the determined 1990 baseline (427 MMT CO₂E).

CARB's Climate Change Scoping Plan. One specific requirement of AB 32 is for CARB to prepare a "scoping plan" for achieving the maximum technologically feasible and cost-effective GHG emission reductions by 2020 (California Health and Safety Code, Section 38561[a]) and to update the plan at least once every 5 years. In 2008, CARB approved the first scoping plan. The *Climate Change Scoping Plan: A Framework for Change* (Scoping Plan) included a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs calculated to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the state's long-range climate objectives. The key elements of the Scoping Plan include the following (CARB 2008):

1. Expanding and strengthening existing energy efficiency programs as well as building and appliance standards

2. Achieving a statewide renewable energy mix of 33%
3. Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions
4. Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets
5. Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (17 CCR 95480 et seq.)
6. Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation

The Scoping Plan also identified local governments as essential partners in achieving California's goals to reduce GHG emissions because they have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Specifically, the Scoping Plan encouraged local governments to adopt a reduction goal for municipal operations and for community emissions to reduce GHGs by approximately 15% from then levels (2008) by 2020. Many local governments developed community-scale local GHG reduction plans based on this Scoping Plan recommendation.

In 2014, CARB approved the first update to the Scoping Plan. The *First Update to the Climate Change Scoping Plan: Building on the Framework* (First Update) defined the state's GHG emission reduction priorities for the next 5 years and laid the groundwork to start the transition to the post-2020 goals set forth in EO S-3-05. The First Update concluded that California is on track to meet the 2020 target but recommended a 2030 mid-term GHG reduction target be established to ensure a continuum of action to reduce emissions. The First Update recommended a mix of technologies in key economic sectors to reduce emissions through 2050, including energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies. As part of the First Update, CARB recalculated the state's 1990 emissions level, using more recent GWPs identified by the Intergovernmental Panel on Climate Change, from 427 MMT CO₂e to 431 MMT CO₂e.

In 2015, as directed by EO B-30-15, CARB began working on an update to the Scoping Plan to incorporate the 2030 target of 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050 as set forth in EO S-3-05. The Governor called on California to pursue a new and ambitious set of strategies, in line with the five climate change pillars from his inaugural address, to reduce GHG emissions and prepare for the unavoidable impacts of climate change. In the summer of 2016, the Legislature affirmed the importance of addressing climate change through passage of SB 32 (Pavley, Chapter 249, Statutes of 2016).

In January 2017, CARB released the *2017 Climate Change Scoping Plan Update* (2030 Scoping Plan) for public review and comment (CARB 2017b). The 2030 Scoping Plan builds on the successful framework established in the initial Scoping Plan and First Update, while identifying new, technologically feasible, and cost-effective strategies that will serve as the framework to achieve the 2030 GHG target and define the state's climate change priorities to 2030 and beyond. The strategies'

“known commitments” include implementing renewable energy and energy efficiency (including the mandates of SB 350), increased stringency of the Low Carbon Fuel Standard, measures identified in the Mobile Source and Freight Strategies, measures identified in the proposed Short-Lived Climate Pollutant Plan, and increased stringency of SB 375 targets. To fill the gap in additional reductions needed to achieve the 2030 target, it recommends continuing the Cap-and-Trade Program and a measure to reduce GHGs from refineries by 20%.

For local governments, the 2030 Scoping Plan replaced the initial Scoping Plan’s 15% reduction goal with a recommendation to aim for a community-wide goal of no more than 6 MT CO₂E per capita by 2030 and no more than 2 MT CO₂E per capita by 2050, which are consistent with the state’s long-term goals. These goals are developed around the scientifically based levels necessary to limit global warming below 2 degrees Celsius (°C). The 2030 Scoping Plan recognized the benefits of local government GHG planning (e.g., through climate action plans) and provide more information regarding tools CARB is working on to support those efforts. It also recognizes the CEQA streamlining provisions for project-level review where there is a legally adequate climate action plan.³

The Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32, SB 32, and the EOs and establishes an overall framework for the measures that will be adopted to reduce California’s GHG emissions. A project is considered consistent with the statutes and EOs if it meets the general policies in reducing GHG emissions in order to facilitate the achievement of the state’s goals and does not impede attainment of those goals. As discussed in several cases, a given project need not be in perfect conformity with each and every planning policy or goals to be consistent. A project would be consistent if it will further the objectives and not obstruct their attainment.

CARB’s Regulations for the Mandatory Reporting of Greenhouse Gas Emissions. CARB’s Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (17 CCR 95100–95157) incorporated by reference certain requirements that EPA promulgated in its Final Rule on Mandatory Reporting of Greenhouse Gases (Title 40, Code of Federal Regulations, Part 98). Specifically, Section 95100(c) of the Mandatory Reporting Regulation incorporated those requirements that EPA promulgated in the Federal Register on October 30, 2009, July 12, 2010, September 22, 2010, October 28, 2010, November 30, 2010, December 17, 2010, and April 25, 2011. In general, entities subject to the Mandatory Reporting Regulation that emit over 10,000 MT CO₂E per year are required to report annual GHGs through the California Electronic GHG Reporting Tool. Certain sectors, such as refineries and cement plants, are required to report regardless of emission levels. Entities that emit more than the 25,000 MT CO₂E per year threshold are required to have their GHG emission report verified by a CARB-accredited third-party verified.

Executive Order B-30-15. EO B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under EO S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050 as set forth in EO S-3-05. To facilitate achieving this goal, EO B-30-15 called for CARB to update the Scoping Plan to express the 2030 target in terms of MMT CO₂E. The EO also called for state agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets.

³ *Sierra Club v. County of Napa* (2004) 121 Cal.App.4th 1490, *San Francisco Tomorrow et al. v. City and County of San Francisco* (2015) 229 Cal.App.4th 498, *San Franciscans Upholding the Downtown Specific Plan v. City & County of San Francisco* (2002) 102 Cal.App.4th 656, and *Sequoyah Hills Homeowners Assn. V. City of Oakland* (1993) 23 Cal.App.4th 704, 719.

Senate Bill 605 and Senate Bill 1383. SB 605 (2014) requires CARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants (SLCPs) in the state, and SB 1383 (2016) requires CARB to approve and implement that strategy by January 1, 2018. SB 1383 also establishes specific targets for the reduction of SLCPs (40% below 2013 levels by 2030 for methane and HFCs, and 50% below 2013 levels by 2030 for anthropogenic black carbon) and provides direction for reductions from dairy and livestock operations and landfills.

Executive Order S-14-08. EO S-14-08 (November 2008) focused on the contribution of renewable energy sources to meet the electrical needs of California while reducing the GHG emissions from the electrical sector. This EO required that all retail suppliers of electricity in California serve 33% of their load with renewable energy by 2020. Furthermore, the EO directed state agencies to take appropriate actions to facilitate reaching this target. The California Natural Resources Agency (CNRA), through collaboration with the CEC and California Department of Fish and Wildlife (formerly the California Department of Fish and Game), was directed to lead this effort.

Executive Order S-21-09 and Senate Bill X1-2. EO S-21-09 (September 2009) directed CARB to adopt a regulation consistent with the goal of EO S-14-08 by July 31, 2010. CARB was further directed to work with the CPUC and CEC to ensure that the regulation builds upon the Renewables Portfolio Standard (RPS) program and was applicable to investor-owned utilities, publicly owned utilities, direct access providers, and community choice providers. Under this order, CARB was to give the highest priority to those renewable resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health and can be developed the most quickly in support of reliable, efficient, cost-effective electricity system operations. On September 23, 2010, CARB initially approved regulations to implement a Renewable Electricity Standard. However, this regulation was not finalized because of subsequent legislation (SB X1-2, Simitian, statutes of 2011) signed by Governor Brown in April 2011.

SB X1-2 expanded the RPS by establishing a renewable energy target of 20% of the total electricity sold to retail customers in California per year by December 31, 2013, and 33% by December 31, 2020, and in subsequent years. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation (30 MW or less), digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and that meets other specified requirements with respect to its location.

SB X1-2 applies to all electricity retailers in the state including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must meet the renewable energy goals listed above.

Senate Bill 350. SB 350 (October 2015) further expanded the RPS by establishing a goal of 50% of the total electricity sold to retail customers in California per year by December 31, 2030. In addition, SB 350 included the goal to double the energy efficiency savings in electricity and natural gas final end uses (such as heating, cooling, lighting, or class of energy uses on which an energy-efficiency program is focused) of retail customers through energy conservation and efficiency. The bill also requires the CPUC, in consultation with the CEC, to establish efficiency targets for electrical and gas corporations consistent with this goal.

California Air Pollution Control Officers Association

The California Air Pollution Control Officers Association (CAPCOA) is the association of air pollution control officers representing all 35 air quality agencies throughout California. CAPCOA is not a regulatory body, but it has been an active organization in providing guidance in addressing the CEQA significance of GHG emissions and climate change as well as other air quality issues.

Regional Programs

In July 2007, the YSAQMD adopted the *Handbook for Assessing and Mitigating Air Quality Impacts* (CEQA Handbook). The CEQA Handbook does not provide any quantitative thresholds for assessing GHG emissions, but does state that GHG emissions are an area of concern in environmental documents. The CEQA Handbook recommends that at least a qualitative assessment is made, noting that vehicle trips represent a particular area of concern.

Local Plans and Policies

UC Davis 2003 Long Range Development Plan

The 2003 LRDP is the plan for the development of the campus. Although the 2003 LRDP does not contain policies that specifically address GHG emissions, it does contain a number of elements with respect to fuel- and energy-efficiency provisions and elements that would encourage walking and bicycling on campus and in surrounding neighborhoods, all of which would reduce GHG emissions.

UC Policy on Sustainability Practices

The Sustainable Practices Policy (“Policy”) establishes goals in nine areas of sustainable practices: green building, clean energy, transportation, climate protection, sustainable operations, waste reduction and recycling, environmentally preferable purchasing, sustainable foodservice, sustainable water systems (UC Regents 2016).

UC Office of the President Carbon Neutrality Initiative

This initiative sets a goal to bring the University of California system to carbon-neutrality in its operations by 2025 (UCOP 2013). To achieve this goal, the initiative proposes four efforts: (1) create a shared service center which will manage the supply of wholesale electricity to the five campuses currently eligible for direct access; (2) continue to invest in energy efficiency and renewable energy generation; (3) manage the purchase of natural gas and also develop renewable natural gas (“biogas”); and (4) engage in the portfolio management of allowances and offsets and compliance with California’s cap and trade program and other environmental attribute programs in order to fund GHG reduction efforts.

UC Davis Climate Action Plan

The UC Policy on Sustainable Practices – Climate Protection section identifies the following goals: reduction of GHG emissions back to 2000 levels by 2014, reduction of GHG emissions to 1990 levels by 2020, and development of a plan for becoming climate neutral, meaning that the University would have a neutral impact on the Earth’s climate through reducing GHG emissions and by using carbon offsets or mitigation.

The 2009-2010 Climate Action Plan (CAP) prepared by UC Davis, includes both the Davis and Sacramento campuses, as well as outlying facilities (UC Davis 2010). The CAP describes and addresses policy and regulatory requirements of (1) the UC Policy on Sustainable Practices, (2) AB 32, (3) the American College and University Presidents Climate Commitment, (4) CEQA, and (5) U.S. EPA reporting requirements. The CAP provides documentation of how campus GHG emissions are calculated, a report of current (2008) emissions, estimates of past (to 1990) and future emissions (to 2020), a statement of GHG emission reduction goals, a characterization of options and methods to reduce emissions, and a blueprint for future action.

The CAP focuses on both 2014 and 2020 targets, with the understanding that climate neutrality will require fundamental shifts in global and national energy policy, energy production, and technologies currently using fossil fuels. The CAP also looks at GHG emissions associated with campus operations, instead of commuting and air travel, because emissions related to commuting and air travel are less than one-quarter those of campus operations. The CAP does provide analysis of commuting and air travel reduction options, but does not quantify emissions reductions for those options.

GHG emissions were calculated from 1990 to 2008, while using a mix of hard data and projected data for as many emission sources as possible. Calculated emissions for all of UC Davis, excluding commuting and air travel, are 245,837 MT CO₂E for year 2000 and 142,196 MT CO₂E for year 1990. In 2008, inventoried emissions in the California Climate Action Registry, excluding commuting and air travel, totaled 239,060 MT CO₂E, indicating that UC Davis had already met the 2014 target. Thus, the CAP defined a new emissions target for 2014 of 210,000 MT CO₂E, approximately equivalent to GHG levels in 1999. The UC Davis target to reach 1990 emissions by the year 2020 is about 40 percent below the 2008 emissions.

Inventoried for both direct and indirect emissions have shown consistently that the Davis campus contributes about 70 percent of the emissions total, the Sacramento campus contributes about 29 percent of the total, and the outlying facilities contribute about 1 percent of the total.

6.7.3 Standards of Significance

The significance criteria used to evaluate the Project's GHG emissions impacts is based on the recommendations provided in Appendix G of the CEQA Guidelines. For the purposes of this GHG emissions analysis, the Project would have a significant environmental impact if it would (14 CCR 15000 et seq.):

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

The State CEQA Guidelines include a new Section 15064.4, which states that, when making a determination of the significance of GHG emissions, a lead agency shall have discretion to determine whether to (1) use a model or methodology to quantify GHG emissions resulting from a project, and which model or methodology to use; and/or (2) rely on a qualitative analysis or performance based standards. Section 15064.4 also provides that a lead agency may consider the following factors when assessing the significance of GHG emissions on the environment: (1) The extent to which the Project may increase or reduce GHG emissions as compared to the existing environmental setting; (2) whether the Project emissions exceed a threshold of significance that the lead agency determines applies to the Project; and (3) The extent to which the Project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

Under CEQA, "the determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data."⁴ CEQA grants agencies with the general authority to adopt criteria for

⁴ *State CEQA Guidelines* Section 15064(b).

determining whether a given impact is “significant.”⁵ When no guidance exists under CEQA, the agency may look to and assess general compliance with comparable regulatory schemes.

Although the YSAQMD has no proposed specific thresholds for GHGs, a neighboring jurisdiction, the Sacramento Metropolitan Air Quality Management District (SMAQMD), has adopted the quantitative threshold for both construction and operational GHG emissions of 1,100 MT CO₂E for land use development projects, based on substantial evidence (SMAQMD 2015). SMAQMD GHG thresholds have been used for other projects in the YSAQMD jurisdiction as well. A project that exceeds the thresholds may have a cumulatively considerable contribution of GHG emissions.

6.7.4 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP on GHG emissions were not evaluated in the 2003 LRDP EIR. The inclusion of GHG emissions as an environmental impact for CEQA analysis began in 2007-08 when AB 32 was enacted, and the guidance on this matter has been evolving since that time. In 2010, modifications to Appendix G of the State CEQA Guidelines resulted in the inclusion of detailed guidance for CEQA GHG impact analysis.

6.7.5 Environmental Checklist and Discussion

GREENHOUSE GAS EMISSIONS					
Would the project...	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose or reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a) Construction

Construction of the Project would result in short-term GHG emissions through the use of construction equipment, trucks hauling construction materials and demolition debris, and worker trips. CalEEMod was used to calculate the annual GHG emissions based on the construction scenario as provided in Section 7.3 Air Quality, of this document. It was assumed that total construction and demolition would occur over a period of 10 years, with each year consisting of an estimated 7-month construction period followed by 3 weeks of demolition at the Orchard Park site. Notably, since it was assumed that the same amount of construction and demolition would occur each year, only one period of construction and demolition was modeled to estimate the representative annual emissions. **Table 7-4, Estimated Annual Construction GHG Emissions**, presents estimated construction emissions.

⁵ See *Cal. Pub. Resources Code* Section 21082.

**Table 7-4
Estimated Annual Construction GHG Emissions**

Year	MT CO ₂	MT CH ₄	MT N ₂ O	MT CO ₂ E
Year 2018 – Representative Annual Construction Emissions	92.16	0.02	0.00	92.77
<i>Pollutant Threshold</i>				<i>1,100</i>
Threshold Exceeded?				No

Notes: Detailed results are included in Appendix B.

MT = metric tons; CO₂ = carbon dioxide; CH₄ = methane; N₂O = nitrous oxide; CO₂E = carbon dioxide equivalent. As shown in Table 7-4, estimated annual construction GHG emissions would be approximately 93 MT CO₂E per year, as a result of construction-related activities. Therefore, construction impacts of the Project would not exceed the applied threshold of 1,100 MT CO₂E per year and impacts would be less than significant. No mitigation measures are required.

Operation

Following the completion of construction activities, the Project would generate GHG emissions primarily from energy sources (natural gas combustion for heating and electricity generation for lighting and water conveyance). Existing and Project natural gas use estimates are based on the square footage of greenhouses under each scenario and therms provided by UC Davis for several other metered greenhouses on campus (UC Davis 2017). In regards to electricity usage, a lighting calculator (Nelson and Bugbee 2014) was used assuming that the Project would incorporate energy efficient LEDs and that the Orchard Park Greenhouses use HPS, with lights operating 4,380 hours per year (average of 12 hours per day). For water usage and conveyance, it was assumed that the existing greenhouses to be demolished and the Project greenhouses would use 0.3 gallons per square-foot of growing area per day, which is a “general rule of thumb” from “Sizing the Greenhouse Water System” (University of Massachusetts Extension 2009). The PG&E electricity RPS was adjusted based on the appropriate year of analysis for the existing scenario (year 2017, so 20% RPS assumed) and the Project (buildout year 2028, so 33% RPS assumed⁶). In addition, the Project would generate off-site mobile emissions for employee trips. However, the Project would employ only 10 staff at the greenhouses, with employee trips already considered in the 2003 LRDP EIR. Therefore, the minimal emissions from mobile sources were not quantified for this analysis.

Based on the above information, the estimated operational GHG emissions from the Project and the existing Orchard Park greenhouses to be demolished are provided below in **Table 7-5, Estimated Annual Operational Greenhouse Gas Emissions**. Detailed emission assumptions and calculations are included in Appendix B.

**Table 7-5
Estimated Annual Operational Greenhouse Gas Emissions**

Emissions Source	CO ₂	CH ₄	N ₂ O	CO ₂ E
	<i>metric tons per year</i>			
<i>Existing Orchard Park Greenhouses</i>				
Energy (Electricity and Natural Gas)	2,248.85	2.27	5.50	2,256.61
Water Conveyance	6.00	0.0003	0.0001	6.03
Combined Emissions	2,254.85	2.27	5.50	2,262.64

⁶ Notably, 33% RPS was assumed for PG&E in 2028 (Project buildout operations), even though the RPS is required to be at least 50% by the end of 2030. Based on the operational year assessed for the Project, the RPS would likely be closer to the 50% requirement; therefore, the 33% used in this analysis is a conservative assumption.

**Table 7-5
Estimated Annual Operational Greenhouse Gas Emissions**

Emissions Source	CO ₂	CH ₄	N ₂ O	CO ₂ E
	<i>metric tons per year</i>			
<i>Proposed Project</i>				
Energy (Electricity and Natural Gas)	1,658.18	1.53	3.54	1,663.24
Water Conveyance	6.73	0.0003	0.0001	6.75
Combined Emissions	1,664.91	1.53	3.54	1,669.99
Net increase (Proposed Project minus Existing)				(592.65)
<i>Pollutant Threshold</i>				<i>1,100</i>
Threshold Exceeded?				No

Notes: Values in (parentheses) represent a negative number. Detailed results are included in Appendix B. CO₂ = carbon dioxide; CH₄ = methane; N₂O = nitrous oxide; CO₂E = carbon dioxide equivalent

As shown in Table 7-5, the Project would result in a decrease of 593 MT CO₂E per year relative to existing conditions. Therefore, the Project’s operational GHG emissions would not exceed the applied threshold of 1,100 MT CO₂E per year and the impact of the Project on climate change would be less than significant.

b) The GHG reduction plan applicable to the Project is the 2009-2010 UC Davis CAP. In addition, the UC Policy on Sustainable Practices and the UCOP Carbon Neutrality Initiative include policy goals, which would help guide UC Davis in reducing GHG emissions. The CAP identifies goals and policies that will help UC Davis meet reduction targets for 2014 and 2020. The Sustainable Practices policy includes an objective for new construction to use 20% less energy as compared to current Title 24 energy efficiency standards, and to achieve a LEED-NC designation of Silver or higher. In addition, UC Davis policy targets a 25% reduction in energy relative to Title 24 standards. However, due to the unique nature of greenhouses, the project will not be LEED certified. Nevertheless, the Project would replace older, less efficient greenhouses, with new technology, and therefore would not conflict with the UCOP Carbon Neutrality Initiative’s goal of net carbon neutrality by the year 2025, and is consistent with the energy efficiency objectives of the Initiative.

In regards to consistency with EO B-30-15 (goal of reducing GHG emissions to 40% below 1990 levels by 2030) and EO S-3-05 (goal of reducing GHG emissions to 80% below 1990 levels by 2050), there are no established protocols or thresholds of significance for that future year analysis. However, CARB forecasts that compliance with the current Scoping Plan puts the state on a trajectory of meeting these long-term GHG goals, although the specific path to compliance is unknown (CARB 2014). As discussed previously, the Project would comply with the goals and policies of the UC Davis CAP and UC Policy on Sustainability Practices and would not conflict with the state’s trajectory toward future GHG reductions. In addition, since the specific path to compliance for the state in regards to the long-term goals would likely require development of technology or other changes that are not currently known or available, specific additional mitigation measures for the Project would be speculative and cannot be identified at this time. With respect to future GHG targets under the EOs, CARB has also made clear its legal interpretation that it has the requisite authority to adopt whatever regulations are necessary, beyond the AB 32 horizon year of 2020, to meet EO S-3-05’s 80% reduction target in 2050; this legal interpretation by an expert agency provides evidence that future regulations will be adopted to continue the state on its trajectory toward meeting these future GHG targets. Finally, the Project would not exceed the applied threshold of 1,100 MT CO₂E per year. Because the Project would not exceed the threshold, this analysis provides support for the conclusion that the Project would not conflict with the post-2020 GHG reduction goals for California. Therefore, this impact would be less than significant.

Based on the preceding considerations, the Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and no mitigation is required. This impact would be less than significant.

6.8 HAZARDS & HAZARDOUS MATERIALS

6.8.1 Background

Section 4.7 of the 2003 LRDP EIR addresses the hazards and hazardous materials effects of campus growth under the 2003 LRDP. The following discussion summarizes information presented in the 'Setting' subsection of Section 4.7 of the 2003 LRDP EIR.

Environmental Setting

A variety of hazardous materials are used on the UC Davis campus during the course of daily operations. Hazardous chemicals used on the campus include: chemical solvents, reagents, and aromatic hydrocarbons that are used in campus laboratories; pesticides, fungicides, and herbicides used by agricultural programs and in landscape maintenance; relatively small amounts of solvents, paints, and acids used by fine arts programs; gasoline and diesel fuels, oils and lubricants, antifreeze, cleaning solvents and corrosives, paints and paint thinners, and freon refrigerants used in vehicle and building maintenance. In addition, radioactive materials, biohazardous materials, and laboratory animals are used in teaching and research activities. The use of hazardous materials on the campus generates hazardous byproducts that must eventually be handled and disposed of as hazardous wastes.

Generation, transportation, and disposal of hazardous wastes are regulated by various agencies. The lead federal regulatory agency is the Environmental Protection Agency. The State Department of Toxic Substances Control (DTSC) has primary state regulatory responsibility but can delegate enforcement authority to local jurisdictions that enter into agreements with the state agency, as it did with Yolo County Department of Environmental Health (YCDEH) under the Certified Unified Program Agency (CUPA) program.

The campus' Office of Environmental Health and Safety (EH&S) coordinates most local, state, and federal regulatory compliance functions related to the campus' health, safety, and environmental issues. EH&S performs safety education and training, regulatory interpretation and applicability, approval of potentially hazardous procedures, resolution of safety problems, surveillance, and monitoring. In addition, EH&S provides guidance for several campus safety programs, including: the Chemical Inventory System, which tracks inventory and use of hazardous materials on campus; the CUPA Self-Audit Program, which complies with the terms of an agreement with the YCDEH; development of laboratory-specific Chemical Hygiene Plans; the Radiation and X-Ray Safety Programs; and the Biological Safety Administrative Advisory Committee. EH&S is also a working partner in such campus administrative advisory groups as the Chemical Safety Committee, the Radiation Safety Committees, the Animal Use and Care Committee, and the Biological Safety Committee. External administrative and benchmarking reviews of the EH&S programs are conducted periodically to identify means of further improving the programs.

Project Site

The CORE 2 Project site is located in the central campus, between Extension Center Drive and Hutchison Drive. The CORE 2 Project site contains agricultural research/teaching fields and the existing Tall Corn greenhouse building and is surrounded by similar academic uses. The site is located approximately 0.03 miles east of Highway 113.

The Orchard Park Greenhouses site is located southeast of Orchard Park Road and Orchard Road. The Orchard Park Greenhouses site is primarily surrounded by student housing and services and contains greenhouses and support structures.

6.8.2 2003 LRDP EIR Standards of Significance

The 2003 LRDP EIR considers a hazards and hazardous materials impact significant if growth under the 2003 LRDP would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- 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.
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school.
- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment.
- For a project within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the Project area.
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

Additional standards from the CEQA Guidelines’ Environmental Checklist (“f” and “h” in the checklist below) were found not applicable to campus growth under the 2003 LRDP.

6.8.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP related to hazards and hazardous materials are evaluated in Section 4.7 of the 2003 LRDP EIR. The Project is within the scope of analysis in the 2003 LRDP EIR and potentially significant hazards and hazardous materials impacts identified in the 2003 LRDP EIR that are relevant to the Project are presented below with their corresponding levels of significance before and after application of mitigation measures identified in the 2003 LRDP EIR. In addition, LRDP Impacts 4.7-12 and 4.7-13, presented below, are considered less than significant prior to mitigation, but the 2003 LRDP EIR identified mitigation to further reduce the significance of these impacts. Less than significant impacts without mitigation measures are not presented here.

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
HAZARDS & HAZARDOUS MATERIALS			
4.7-1	Implementation of the 2003 LRDP would increase routine hazardous chemical use on campus by UC Davis laboratories and departments and in maintenance and support operations, which would not create significant hazards to the public or the	LS	LS

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
HAZARDS & HAZARDOUS MATERIALS			
	environment.		
4.7-2	Implementation of the 2003 LRDP could increase routine generation of hazardous wastes on campus by UC Davis laboratories and departments and from maintenance and support operations, which would not create significant hazards to the public or the environment.	LS	LS
4.7-8	Implementation of the 2003 LRDP would increase the routine transport of hazardous materials to and from campus, which would not significantly increase hazards to the public or the environment	LS	LS
4.7-9	Implementation of the 2003 LRDP would not 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.	LS	LS
4.7-12	Construction activities on campus under the 2003 LRDP would not expose construction workers and campus occupants to contaminated soil or groundwater.	LS	LS
4.7-13	Demolition or renovation of buildings under the 2003 LRDP would not expose construction workers or campus occupants to contaminated building materials.	LS	LS
4.7-16	Hazardous materials use on campus under the 2003 LRDP would not exceed emergency response capabilities.	LS	LS
4.7-17	Campus development under the 2003 LRDP could physically interfere with the campus' Emergency Operations Plan.	PS	LS
4.7-18	Campus development under the 2003 LRDP in combination with growth in the region would not significantly increase hazards to the public or the environment associated with the use and transport of hazardous materials and the generation of hazardous wastes.	LS	LS

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

Mitigation measures in the 2003 LRDP EIR that are applicable to the Project are presented below. Since these mitigation measures are already being carried out as part of implementation of the 2003 LRDP, they are considered part of the Project description and will not be readopted in this Initial Study or Negative Declaration. Nothing in this Initial Study in any way alters the obligations of the campus to implement 2003 LRDP EIR mitigation measures.

2003 LRDP EIR Mitigation Measures

HAZARDS & HAZARDOUS MATERIALS

4.7-1 The campus shall continue to implement the same (or equivalent) safety plans, programs, practices, and procedures related to the use, storage, and disposal of hazardous chemical materials during the 2003 LRDP planning horizon, including, but not necessarily limited to, the Business Plan, Hazardous Materials Communication Program, Chemical Inventory System, CUPA Self-Audit program, Injury and Illness Prevention Program, Chemical Hygiene Plans, Medical Surveillance Program, Chemical Safety Advisory Committee, Chemical Carcinogen Safety Program, and EH&S audits and safety training. These programs may be replaced by other programs that incorporate similar health and safety measures.

4.7-12 The campus shall perform due diligence assessments of all sites where ground-disturbing construction is proposed.

4.7-13 The campus shall survey buildings for potential contamination before any demolition or renovation work is performed.

6.8.4 Environmental Checklist and Discussion

HAZARDS & HAZARDOUS MATERIALS	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) 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, would the project result in a safety hazard for people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

HAZARDS & HAZARDOUS MATERIALS		Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project... residing or working in the project area?						
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) The Project would use routine hazardous materials during construction (such as paints, solvents and gasoline for motorized equipment) and operation (such as cleaning chemicals, solvents, and pesticides).

Hazardous Chemicals

The 2003 LRDP EIR found that implementation of the 2003 LRDP would increase routine hazardous chemical use (LRDP Impact 4.7-1), routine generation of hazardous chemical wastes (LRDP Impact 4.7-2), and routine hazardous materials transport to and from the campus (LRDP Impact 4.7-8) by UC Davis laboratories, departments, and maintenance/support operations, which would not create significant hazards to the public or the environment. The campus achieves a high level of compliance with regulatory standards and campus policies relevant to use, transport, and disposal of hazardous materials, as discussed further in the ‘Setting’ subsection to Section 4.7 of the 2003 LRDP EIR. Hazardous waste treatment, storage, and disposal facilities currently have available capacity to accept and safely manage UC Davis chemical waste. The Project would use minimal hazardous chemicals such as cleaners, solvents, and pesticides. Pesticides would be stored in the CORE headhouse pesticide storage room to the east of the CORE 2 Project site. Use and storage of pesticides is regulated by the California Department of Pesticide Regulation. Pesticides would continue to be stored in the existing storage room and the Project would follow all applicable regulations regarding the use and storage of pesticides. The campus will continue to implement relevant safety programs and meet relevant standards regarding hazardous materials use, transport, and waste management for the Project, as well as for other projects proposed under the 2003 LRDP. Therefore, the Project impact would be less than significant.

The 2003 LRDP EIR found that development under the 2003 LRDP, in conjunction with regional growth would not significantly increase the hazard to the public or environment from the use and transport of hazardous materials and the generation of hazardous wastes (LRDP Impact 4.7-18). The Project would generate minimal amounts of hazardous waste and would not contribute to the cumulative impact identified in the 2003 LRDP EIR.

Given the campus’ and local jurisdiction’s existing policies and compliance with state and federal regulations, the 2003 LRDP EIR found that cumulative impacts related to the use and transport of hazardous materials and the generation of hazardous waste are less than significant.

Radioactive Materials

No radioactive materials would be used in connection with the Project. No impact would occur.

Biohazardous Materials

No biohazardous materials would be used in connection with the Project. No impact would occur.

Laboratory Animals

No laboratory animals would be used in connection with the Project. No impact would occur.

Cumulative Impacts

The 2003 LRDP EIR concluded that implementation of the 2003 LRDP, in conjunction with other development in the region, would not result in significant cumulative effects related to hazards and hazardous materials. Because the Project is within the scope of development under the 2003 LRDP and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter this previous analysis or conclusion.

b) The 2003 LRDP EIR found that implementation of the 2003 LRDP would not 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 (Impact 4.7-9). Compliance with all applicable federal and state laws, as well as campus programs, practices, and procedures related to the transportation, storage, and use of hazardous materials, would continue for the Project as well as other projects proposed under the 2003 LRDP, minimizing the potential for an accidental release of hazardous materials and providing for prompt and effective cleanup if an accidental release occurs.

The 2003 LRDP EIR found that construction activities under the 2003 LRDP would not expose construction workers and campus occupants to contaminated soil or groundwater (LRDP Impact 4.7-12) and that demolition or renovation of buildings under the 2003 LRDP would not expose construction workers or campus occupants to contaminated building materials (LRDP Impact 4.7-13). Campus policy requires that due diligence surveys be performed for all Project sites as part of the Project planning process, per LRDP Mitigation Measures 4.7-12 and -13. Due to the phased nature of the Project, surveys will be conducted prior to demolition of a greenhouse at the Orchard Park site, and the specific recommendations to protect the health and safety of the workers and campus population during demolition would be carried out.

Hazardous materials and hazardous chemical waste is required to be collected by Environmental Health and Safety (EH&S) or by an off site contractor approved by EH&S. Materials or waste is typically picked up by EH&S within 4 to 5 working days. Campus policies require that hazardous waste is properly packaged and labeled by users prior to pickup to diminish the potential for accident conditions.

Hazardous wastes on the campus are disposed of in the campus Environmental Services Facility (ESF), located approximately 0.15 mi from the intersection of Campbell Road and Garrod Drive. The facility was designed with protective engineering controls evaluated by a Certified Industrial Hygienist. Workers at the facility are required to use protective equipment to prevent workplace hazardous materials exposure.

Therefore, with the implementation of LRDP mitigation and the procedures outlined in the Radiological Survey and Sampling Plan, the impact related to exposure to existing contamination on the Project site would be less than significant.

c) The Project would use routine hazardous materials during construction (such as paints, solvents, gasoline for motorized equipment) and operation (such as cleaning chemicals, pesticides, and solvents) but would not involve any new sources of hazardous air emissions. Furthermore, the Project would not be located within ¼ mile of a school. No impact would occur.

d) The Laboratory for Energy Related Research/South Campus Disposal site is the only campus site that is listed as a hazardous materials site pursuant to Government Code Section 65962.5. The Project would not disturb this site and no impact would occur.

e) The CORE 2 Project site is approximately 1.2 miles northeast of the University airport and the Orchard Park Greenhouses site is approximately 1.5 miles northeast of the University airport. The 2003 LRDP EIR found that development of certain projects on the west campus under the 2003 LRDP could result in safety hazards associated with aircraft. However, the Project is not one of these projects and would not conflict with airport operations. Therefore, the impact would be less than significant.

f) The University Airport is a public use airport, not a private airstrip. No other airport facilities are in the immediate vicinity of the campus. No impact would occur. Refer to item e) above for a discussion of potential safety hazards associated with the University airport, a local public use airport.

g) The 2003 LRDP EIR found that implementation of the 2003 LRDP could interfere with the campus' Emergency Operations Plan through construction-related road closures (LRDP Impact 4.7-17). Project construction and demolition activities on the CORE 2 Project site and the Orchard Park Greenhouses site would not impede access to surrounding roadways. No impact associated with interference of an adopted emergency response plan or emergency evacuation plan would occur.

h) Areas along Putah Creek are the only areas on the campus that could be susceptible to wildland fires. Urbanization will not occur in close proximity to these areas under the 2003 LRDP because land along Putah Creek is designated for Open Space and Teaching and Research Fields, and land adjacent to these open areas is designated primarily for Teaching and Research Fields and low density development. The Project site is located north of Putah Creek amid dense development. Therefore, no impact would occur.

6.9 HYDROLOGY & WATER QUALITY

6.9.1 Background

Section 4.8 of the 2003 LRDP EIR addresses the hydrology and water quality effects of campus growth under the 2003 LRDP. The following discussion summarizes information presented in the 'Setting' subsection of Section 4.8 of the 2003 LRDP EIR.

Environmental Setting

Surface Water Resources

The UC Davis campus and the Project site are located in the Lower Sacramento watershed. Putah Creek, the principal waterway in the Davis area, originates from springs in the Mayacamas Mountains northwest of the campus, flows into Lake Berryessa, through Winters, along the southern boundary of Russell Ranch, along the southern boundary of UC Davis' west and south campuses, and eventually into the Yolo

Bypass, an overflow channel for the Sacramento River. The North Fork Cutoff and the Arboretum Waterway on campus follow the historic channel of Putah Creek, but currently have no natural flow. The North Fork Cutoff is a typically dry stream channel on the west campus that is currently occupied by sheep and cattle programs in the Department of Animal Science. The Arboretum Waterway serves as the storm water detention basin for the central campus.

UC Davis is a member of the Solano Project, and currently has rights to purchase 4,000 acre-feet of Putah Creek water from Lake Berryessa per year, although reductions in deliveries can occur during drought conditions. The water is delivered to the southwest corner of the campus via an underground pipeline. UC Davis also has rights to surface water from Putah and Cache Creeks. The campus has not used this water in the recent past, but the tenant farmer at Russell Ranch uses approximately 3,750 acre-feet of water per year from Putah and Cache Creeks (via Willow Canal) for irrigation of commercial crops.

The quantity and quality of flows in Putah Creek are highly variable and depend on releases from Lake Berryessa, precipitation, storm water runoff, and treated effluent discharge. The campus' tertiary level Wastewater Treatment Plant (WWTP) is the largest discharger of treated effluent to Putah Creek. The plant is regulated under a National Pollutant Discharge Elimination System (NPDES) Waste Discharge Requirement (WDR) permit issued by the Central Valley Regional Water Quality Control Board (CVRWQCB).

Groundwater Resources

The aquifers relied upon by UC Davis consist of sand and gravel alluvial deposits that include deep and shallow/intermediate depth aquifers. Deep gravel and sand aquifers underlie the Project site between 600 to 1,500 feet below ground surface and supply the campus domestic/fire system. Intermediate depth aquifers supply landscape irrigation, utility and agricultural needs on the campus. Historic annual domestic water use on campus over the past three decades has ranged from less than 600 million gallons per year (mgy) during drought conditions to nearly 900 mgy (UC Davis 1997). Despite the campus' significant growth in recent decades, the campus' deep aquifer demands have not significantly increased since the late 1960s (Ludorff and Scalmanini 2003), a trend that reflects the success of the campus' water conservation efforts.

The shallow/intermediate depth sand and gravel aquifers underlie the Project site at depths from 150 to 800 feet below ground surface and supply the campus utility water system, main campus agricultural water needs, and campus and tenant farmer irrigation needs at Russell Ranch. Water levels in the shallow/intermediate aquifer vary seasonally and strongly correlate to precipitation. A generally upward recharge trend over the period from 1957 to 2002 indicates that there has not been long-term overdraft of the shallow/intermediate depth aquifers (Ludorff and Scalmanini 2003).

Regional groundwater quality is generally characterized as having high mineral content. Calcium, magnesium, and sulfates have been identified as the dominant problematic constituents. UC Davis has recently gained the ability to purchase wholesale treated surface water from the Woodland Davis Clean Water Agency, which will allow some of the intermediate aquifer wells to be kept for emergency supply only (Brown and Caldwell 2016).

Flooding & Drainage

The Project site is not located within a Federal Emergency Management Agency (FEMA) Special Flood Hazard Area, which includes 100-year flood zones (DWR 2016). Furthermore, the Project site is also not within a 500-year flood zone or other flood zone as mapped by the Department of Water

Resources (DWR “Awareness” Floodplain), regional/special studies, or the U.S. Army Corps of Engineers (DWR 2016).

The central campus drainage system intercepts and collects runoff and directs this water via underground pipes to the Arboretum Waterway. During large storm events, water rises in the Arboretum Waterway, overtops the weir at the west end of the waterway, and flows into the pump pond located north of the weir. From the pump pond, water is pumped through an underground storm drain to the South Fork of Putah Creek. The peak discharge from the Arboretum Waterway to Putah Creek since December 1999 was 65 cubic feet per second (cfs). The majority of land in the west and south campuses and at Russell Ranch is used as teaching and research fields and is not drained by a storm drainage system. Irrigation practices on campus teaching and research fields typically do not generate surface runoff. However, large storm events may result in shallow overland flows that flow to temporary shallow ponds in places such as road and field edges. In addition, developed areas on the west and south campuses include storm water conveyance systems that drain to Putah Creek.

To protect the quality of storm water on the campus that ultimately drains to Putah Creek, UC Davis construction and industrial activities are subject to the NPDES storm water requirements. Routine maintenance and minor construction activities on the campus are subject to the campus’ Phase II Storm Water Management Plan (SWMP).

Project Site

The CORE 2 Project site is located in the central campus and contains agricultural research/teaching fields and one existing greenhouse building. The Orchard Park Greenhouses site is located southeast of Orchard Park Road and Orchard Road and contains greenhouses and support structures. Runoff from the Project sites flows into campus storm drains that discharge into the Arboretum Waterway.

6.9.2 2003 LRDP EIR Standards of Significance

The 2003 LRDP EIR considers a hydrology and water quality impact significant if growth under the 2003 LRDP would:

- Violate any water quality standards or waste discharge requirements.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on site or off site.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on site or off site.
- Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrade water quality.
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury, or death involving flooding.

Additional standards from the CEQA Guidelines' Environmental Checklist ("g" and "j" in the checklist below) were found not applicable to campus growth under the 2003 LRDP.

6.9.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP on hydrology and water quality are evaluated in Section 4.8 of the 2003 LRDP EIR. The Project is within the scope of analysis in the 2003 LRDP EIR and significant and potentially significant hydrology and water quality impacts identified in the 2003 LRDP EIR that are relevant to the Project are presented below with their corresponding levels of significance before and after application of mitigation measures identified in the 2003 LRDP EIR. In addition, Impact 4.8-1, presented below, is considered less than significant prior to mitigation, but mitigation measures were identified in the 2003 LRDP EIR to further reduce the significance of this impact. Other less than significant impacts that do not include mitigation measures are not presented here. Mitigation measures are included to reduce the magnitude LRDP Impact 4.8-5 and cumulative LRDP Impact 4.8-13, but these impacts are identified as significant and unavoidable because they cannot be fully mitigated.

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
HYDROLOGY & WATER QUALITY			
4.8-1	Campus construction activities associated with implementation of the 2003 LRDP would not contribute substantial loads of sediment or other pollutants in storm water runoff that could degrade receiving water quality.	LS	LS
4.8-3	Implementation of the 2003 LRDP could alter drainage patterns in the project area and increase impervious surfaces, which could exceed the capacity of storm water drainage systems and result in localized flooding and contribution to offsite flooding.	PS	LS
4.8-4	Campus growth under the 2003 LRDP would increase discharge of treated effluent from the campus wastewater treatment plant into the South Fork of Putah Creek, which could exceed waste discharge requirements and degrade receiving water quality.	PS	LS
4.8-5	Campus growth under the 2003 LRDP would increase the amount of water extracted from the deep aquifer and would increase impervious surfaces. This could result in a net deficit in the deep aquifer volume or a lowering of the local groundwater table but would not interfere substantially with recharge of the deep aquifer.	S	SU
4.8-6	Campus growth under the 2003 LRDP could increase the amount of water extracted from the shallow/intermediate aquifer and would increase impervious surfaces. Extraction from the shallow/intermediate aquifer could deplete groundwater levels and could contribute to local subsidence, and increased impervious coverage could interfere substantially with recharge. This could result in a net deficit in the intermediate aquifer volume or a lowering of the local groundwater table.	S	SU
4.8-10	Development under the 2003 LRDP, in conjunction with construction activities, increased impervious surfaces, and alterations to drainage patterns associated with other development in the region that would increase impervious surface coverage in the watershed, could increase storm water runoff, and could provide substantial sources of polluted runoff, which could affect receiving water quality.	PS	SU
4.8-11	Implementation of the 2003 LRDP in combination with regional development could alter drainage patterns and increase the rate or amount of surface runoff,	PS	LS

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
HYDROLOGY & WATER QUALITY			
	which could exceed the capacity of storm water drainage systems and result in flooding within the Putah Creek watershed.		
4.8-12	Growth under the 2003 LRDP and other development in the region would increase discharge of treated effluent to the Putah Creek watershed, which could degrade receiving water quality.	PS	LS
4.8-13	Growth under the 2003 LRDP and other development in the region would increase the amount of water extracted from the deep aquifer and increase impervious surfaces. This could result in a net deficit in the deep aquifer volume or a lowering of the local groundwater table but would not interfere substantially with recharge of the deep aquifer.	S	SU
4.8-14	Growth under the 2003 LRDP and other development in the region would increase the amount of water extracted from shallow/intermediate aquifers and increase impervious surfaces. This could contribute to local subsidence, substantially deplete groundwater supplies, and could interfere substantially with recharge of the shallow/intermediate depth aquifer, resulting in a net deficit in the shallow/intermediate aquifer volume or a lowering of the local groundwater table.	S	SU

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

Mitigation measures in the 2003 LRDP EIR that are applicable to the Project are presented below. Since these mitigation measures are already being carried out as part of implementation of the 2003 LRDP, they are considered part of the Project description and will not be readopted in this Initial Study or Negative Declaration. Nothing in this Initial Study in any way alters the obligations of the campus to implement 2003 LRDP EIR mitigation measures.

2003 LRDP EIR Mitigation Measures

HYDROLOGY & WATER QUALITY

- | | |
|----------|---|
| 4.8-1 | The campus shall continue to comply with the NPDES state-wide General Permit for Discharge of Storm Water Associated with Construction Activity by implementing control measures and BMPs required by project-specific SWPPPs and with the Phase II SWMP to eliminate or reduce non-storm and storm water discharges to receiving waters. |
| 4.8-4(a) | The campus shall continue to monitor and modify its pretreatment program, WWTP operation, and/or treatment processes as necessary to comply with WDRs. |
| 4.8-4(b) | The campus shall implement a monitoring program specifically targeted at the following constituents: copper, cyanide, iron and nitrate + nitrite, and make appropriate modifications as necessary to the campus pretreatment program to avoid exceedance of permit limits for these constituents. |
| 4.8-5(a) | The campus shall continue to implement water conservation strategies to reduce demand for water from the deep aquifer. Domestic water conservation strategies shall include the following or equivalent measures: <ul style="list-style-type: none"> (i) Install water efficient shower heads and low-flow toilets that meet or exceed building code conservation requirements in all new campus buildings, and where feasible, retrofit existing buildings with these water efficient devices. (ii) Continue the leak detection and repair program. (iii) Continue converting existing single-pass cooling systems to cooling tower systems. (iv) Use water-conservative landscaping on the west and south campuses where domestic water is used for irrigation. |

2003 LRDP EIR Mitigation Measures

HYDROLOGY & WATER QUALITY

- (v) Replace domestic water irrigation systems on the west and south campuses with an alternate water source (shallow/intermediate or reclaimed water), where feasible.
 - (vi) Install water meters at the proposed neighborhood to encourage residential water conservation.
 - (vii) Identify and implement additional feasible water conservation strategies and programs including a water awareness program focused on water conservation.
- 4.8-5(b) The campus shall continue hydrogeologic monitoring and evaluation efforts to determine the long-term production and quality trends of the deep aquifer.
- 4.8-5(c) To the extent feasible, new water supply wells in the deep aquifer should be located on the west campus in sands and gravels that are not used by or available to the City of Davis for deep water extraction.
- 4.8-5(d) If continued hydrogeologic monitoring and evaluation efforts identify constraints in the deep aquifer's ability to provide for the campus' long-term water needs, the campus will treat shallow/intermediate aquifer and/or surface water from the Solano Project to serve domestic water demand.
- 4.8-6(a) The campus shall continue to implement water conservation strategies to reduce demand for water from the intermediate aquifer. Utility water conservation strategies shall include the following or equivalent measures:
- (i) Landscape, where appropriate, with native, drought resistant plants and use lawns only where needed for pedestrian traffic, activity areas, and recreation.
 - (ii) Install efficient irrigation systems including centrally controlled automatic irrigation systems and low-flow spray systems.
 - (iii) Apply heavy applications of mulch to landscaped areas to reduce evaporation
 - (iv) Use treated wastewater for landscape irrigation where feasible.
- 4.8-6(b) The campus shall continue to monitor shallow/intermediate aquifer water elevations at existing campus wells to ascertain whether there is any long-term decline in water levels.
- 4.8-6(c) The campus shall continue to participate in regional subsidence monitoring, including by installing an extensometer, to determine the vertical location of local subsidence.
- 4.8-6(e) The campus shall incorporate the following or equally effective measures into project designs under the 2003 LRDP where feasible, to increase percolation and infiltration of precipitation into the underlying shallow/intermediate aquifers:
- (i) Minimize paved surfaces.
 - (ii) Use grassy swales, infiltration trenches, or grass filter strips to intercept storm water runoff.
 - (iii) Implement LRDP Mitigation 4.8-2(b), which specifies construction of detention and infiltration facilities in those areas that do not discharge storm water to the Arboretum.
- 4.8-12 The campus shall implement LRDP Mitigation 4.8-4(a) and (b) to minimize the potential for degradation of receiving water quality.
- 4.8-13(a) Implement LRDP Mitigation 4.8-5(a-d).
- 4.8-13(b) The City of Davis is expected to implement measures to reduce the amount of water withdrawn from the deep aquifer consistent with policies adopted in its General Plan.
- Give priority to demand reduction and conservation over additional water resource development (Policy WATER 1.1)
 - Require water conserving landscaping (Policy WATER 1.2)
 - Provide for the current and long-range water needs of the Davis Planning Area, and for protection of the quality and quantity of groundwater resources (Policy WATER 2.1)
 - Manage groundwater resources so as to preserve both quantity and quality (Policy WATER 2.2)
 - Research, monitor and participate in issues in Yolo County and the area of origin of the City's groundwater

2003 LRDP EIR Mitigation Measures

HYDROLOGY & WATER QUALITY

that affect the quality and quantity of water (Policy WATER 4.1)

- 4.8-14(a) The campus should implement LRDP Mitigation 4.8-6(a-e) to minimize its withdrawal from the shallow/intermediate aquifer and maximize the potential for infiltration.
- 4.8-14(b) Consistent with current water planning policies, the City of Davis is expected to implement measures to reduce impervious surfaces and reduce the amount of water withdrawn from the shallow/intermediate aquifer, consistent with, but not limited to, the water policies listed in LRDP Mitigation 4.8-13(b).

6.9.4 Environmental Checklist and Discussion

HYDROLOGY & WATER QUALITY

Would the project...	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

HYDROLOGY & WATER QUALITY		Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...						
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j)	Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a,f) **Construction**

The 2003 LRDP EIR found that construction on the campus under the 2003 LRDP would not contribute substantial loads of sediment or other pollutants to storm water runoff (LRDP Impact 4.8-1). Construction projects (including on campus projects) that involve disturbance of over 1 acre of land are required by law to seek coverage under the NPDES *General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities* (Construction General Permit, SWRCB Order No. 2009-0009-DWQ / CAS000002, as amended). To comply with this permit, construction projects disturbing over one acre must implement Storm Water Pollution Prevention Plans (SWPPPs), which specify Best Management Practices (BMPs) to reduce the contribution of sediments, spilled and leaked liquids from construction equipment, and other construction-related pollutants to storm water runoff. As the Project’s construction-related disturbance area would exceed one acre in size, it would be required to submit all permit registration documents (including the SWPPP) to the SWRCB, obtain a waste discharge identification number (WDID) as certification of coverage, and implement the SWPPP during construction activities. The SWPPP identifies which structural and nonstructural BMPs would be implemented, such as sandbag barriers, dust controls, perimeter controls, drain inlet protection, proper construction site housekeeping practices, and construction worker training. This existing requirement is reaffirmed through LRDP Mitigation Measure 4.8-1, included as part of the Project, which requires the campus to implement BMPs to reduce construction-related water quality impacts to less than significant.

Operation

The 2003 LRDP EIR found that campus growth under the 2003 LRDP would increase the discharge of treated effluent from the campus WWTP into the South Fork of Putah Creek, which could exceed waste discharge requirements and degrade receiving water quality (LRDP Impact 4.8-4). With current and future discharge control programs and possible operational changes, the increased discharge from the WWTP associated with the Project as well as other projects under the 2003 LRDP is expected to comply with NPDES regulations, and therefore will not cause degradation of receiving water quality. The campus will continue to monitor effluent discharge in compliance with the applicable WDRs for the WWTP, and if effluent limits are exceeded, the campus will modify its pretreatment program and WWTP operation as appropriate. These practices are further confirmed in LRDP Mitigation 4.8-4(a), which is included as part of the Project. In compliance with LRDP Mitigation 4.8-4(b) the campus will target monitoring and pretreatment for the contaminants specifically identified as of potential concern by the CVRWQCB. These measures would reduce the impact to a less than significant level.

The development will be subject to the most recent standards and performance criteria contained in the *Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems* (Small MS4 Permit). As a project that would replace more than 5,000 sf of impervious service, the Project is a “regulated” project subject to Low Impact Development (LID) standards. LID standards

require site design measures and source control measures, and must meet the required design criteria for on-site storm water detention, as described below

- **Site Design Measures:** Site design measures requires early assessment and evaluation of how site conditions, such as soils, vegetation, and flow paths will influence the placement of buildings and paved surfaces. The evaluation is used to meet the goals of capturing and treating runoff and maximizing opportunities to mimic natural hydrology. Options for site design measures include preserving trees, buffering natural water features, and using green roofs or porous pavement.
- **Source Control Measures:** Source control measures seek to avoid introduction of water quality pollution/degradation altogether. Source control strategies include things like covering refuse/trash areas, properly managing outdoor storage of equipment/materials, minimizing use of pesticides and fertilizers in landscaping, using sumps or special area drains to send non-stormwater discharges to the sewer, ensuring regular grounds maintenance, etc.
- **Treatment Control Measures:** Treatment control measures retain, treat and/or infiltrate the site runoff produced under normal circumstances, controlling both the quality and quantity of stormwater released to the campus conveyance system. In most situations, this means implementing structural BMPs (e.g., infiltration, bioretention and/or rainfall harvest and re-use) to address the volume and rate of runoff produced by 85th percentile storm (i.e., design capture volume).

Given required compliance with the UC Davis stormwater design standards and the Small MS4 Permit, the Project will result in beneficial impacts with respect to stormwater quality during operation and maintenance.

The 2003 LRDP EIR found that growth under the 2003 LRDP and other development in the region would increase the cumulative discharge of treated effluent to the Putah Creek watershed, which could degrade receiving water quality (LRDP Impact 4.8-12). However, UC Davis is currently the largest discharger of treated effluent to Putah Creek, and no other major dischargers are expected in the future. LRDP Mitigation 4.8-12, included as part of the Project, requires implementation of LRDP Mitigation 4.8-4(a-b), discussed above, which would reduce the impact of increased effluent discharge from the campus WWTP to Putah Creek to a less than significant level. Therefore, with implementation of LRDP Mitigation 4.8-12 the cumulative impact would be less than significant. Furthermore, it is anticipated that redevelopment of the site, and implementation of site design measures, would not increase the quantity or degrade the quality of storm water runoff. Because the Project is within the scope of development under the 2003 LRDP and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter this previous analysis.

Summary

Construction-related impacts of the Project with respect to water quality would be less than significant through implementation of the SWPPP required by the Construction General Permit. Long-term operation and maintenance impacts to water quality would not occur through implementation of a Stormwater Quality Control Plan required by the Small MS4 Permit. Therefore, the overall impact of the Project on water quality would be less than significant.

b) ***Deep Aquifer***

The 2003 LRDP EIR found that campus growth under the 2003 LRDP would increase the amount of water extracted from the deep aquifer and would increase impervious surfaces, which could result in a net deficit in the deep aquifer volume or a lowering of the local groundwater table but would not interfere substantially with recharge of the deep aquifer (LRDP Impact 4.8-5). The deep aquifer is confined with limited lateral and vertical recharge and is overlain by thick clay layers that are relatively impermeable.

The 2001 demand for water from the deep aquifer was approximately 2,671 acre-feet. The annual demand for deep aquifer water estimated at full implementation of the 2003 LRDP, including demand associated with the Project, was projected to increase to approximately 5,301 acre-feet (UC Davis ORMP 2003c). In 2007-08, the campus used 2,419 acre-feet from the deep aquifer, which was less than the 2001 water demand from the deep aquifer (D. Phillips, personal communication, 2008). Accordingly, the Project's incremental use of water from the deep aquifer would result in a less than significant impact.

Impact 4.8-13 evaluated whether increased extraction from the deep aquifer in the Davis area could cause groundwater levels to decline and could result in a deficit in the overall groundwater budget. Mitigation 4.8-13(a) requires implementation of LRDP Mitigation 4.8-5(a-d), which require water conservation and aquifer monitoring. Mitigation 4.8-13(b) identifies City of Davis policies aimed at reducing the amount of water withdrawn from the deep aquifer. While these measures would help reduce the impact to the deep aquifer, UC Davis cannot guarantee implementation of LRDP Mitigation 4.8-13(b) because the actions are under the authority of the City of Davis. Thus, the impact was determined to be cumulatively significant and unavoidable.

As discussed above, the Project would have a less-than-significant impact on groundwater levels in the deep aquifer due to minimal use of water from the deep aquifer. While other regional projects may contribute to the significant and unavoidable cumulative impact related to groundwater levels, the Project would result in a less-than-significant contribution to this cumulative impact. Because the Project is within the scope of development under the 2003 LRDP and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter this previous analysis.

Shallow Aquifer

The 2003 LRDP EIR found that the campus' extraction of groundwater from shallow/intermediate aquifers could deplete groundwater levels and could contribute to local subsidence. In addition, increased impervious coverage could interfere with recharge of the shallow/intermediate aquifers. This could result in a net deficit in the intermediate aquifer volume or a lowering of the local groundwater table (LRDP Impact 4.8-6).

The 2001 baseline annual campus demand (including irrigation demand associated with the tenant farmer at Russell Ranch) for water from the shallow/intermediate aquifers was approximately 3,827 acre-feet. Under the 2003 LRDP, due to conversion of teaching and research fields to other uses with reduced irrigation requirements, overall annual demand for water from the shallow/intermediate aquifers is anticipated to decrease to approximately 3,362 acre-feet (UC Davis ORMP 2003c). However, these projections do not address the potential identified in LRDP Mitigation 4.8-5(d) for intermediate aquifer water to be used to serve the campus' domestic water needs. LRDP Mitigation 4.8-6(a-c), included as part of the Project, would require continued utility water conservation efforts, monitoring of the intermediate aquifer, and subsidence monitoring efforts. Furthermore, implementation of LRDP Mitigation 4.8-6(e), included in the Project, would encourage project designs on the campus that increase percolation and infiltration to the shallow/intermediate aquifer. Implementation of LRDP Mitigation 4.8-13(a) and (b) would reduce the campus and City extractions from the shallow/intermediate aquifers, would reduce the amount of new impervious surfaces in the area, and would continue groundwater level and subsidence monitoring efforts. Therefore, the Project would not substantially interfere with the recharge of the shallow/intermediate aquifer and the impact would be less than significant.

Impact 4.8-14 of the 2003 LRDP EIR evaluated whether growth under the 2003 LRDP and other development in the region would increase the amount of water extracted from shallow/intermediate aquifers and increase impervious surfaces. This could contribute to local subsidence, substantially deplete groundwater supplies, and could interfere substantially with recharge of the shallow/intermediate depth aquifer, resulting in a net deficit in the shallow/intermediate aquifer volume or a lowering of the local

groundwater table. The analysis concluded that even with implementation of 2003 LRDP Mitigation 4.8-14(a) and (b), the impact would be significant and unavoidable. This impact was adequately analyzed in the 2003 LRDP EIR and fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP.

As described above, water supply and groundwater impacts from the Project would be less than significant. While other regional projects may still contribute to the significant and unavoidable cumulative impact related to groundwater levels, the Project would not result in a substantial contribution to this cumulative impact. Because the Project is within the scope of development under the 2003 LRDP and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter this previous analysis.

c,d) The CORE 2 Project site currently contains agricultural research/teaching fields and the existing Tall Corn greenhouse. The Orchard Park Greenhouses site contains greenhouses and support structures, surrounded by paved internal access roads. Runoff from both Project sites discharges to the Arboretum Waterway via the campus storm drain system. The Project would involve development of the CORE 2 Project site with greenhouses, support buildings, utilities, parking, access roads, a soil area, and a detention pond. Construction of these features would increase the impervious cover on the CORE 2 Project site. Greenhouses and other structures on the Orchard Park Greenhouses site would be removed with the proposed Project. This would result in a decrease in impervious cover on the Orchard Park Greenhouses site. Therefore, overall surface runoff within the Project area would likely not increase substantially. The inclusion of a storm water detention basin on the Core 2 Project site would retain runoff for the project site and reduce impacts to water quality, flooding, and erosion.

Although redevelopment would involve minor highly-localized changes in drainage patterns on the site itself, the required implementation of a Stormwater Quality Control Plan and compliance with the Small MS4 Permit means such changes would be beneficial in nature (with regard to both erosion/siltation and flooding). Therefore, no impact would occur.

Impact 4.8-10 of the 2003 LRDP EIR concluded that urban development within the Putah Creek watershed would increase impervious areas and consequently increase stormwater runoff. While mitigation measures requiring compliance with National Pollutant Discharge Elimination System (NPDES) Phase II regulations would protect water quality, implementation of mitigation measures for all projects in the cumulative context cannot be guaranteed by the University of California because it falls within other jurisdictions to enforce and monitor, and the effectiveness of the program in these jurisdictions has not been demonstrated. Therefore, the cumulative impact is significant and unavoidable.

The Project would increase impervious surfaces, which could increase stormwater runoff. However, the Project is within the scope of the 2003 LRDP and would be subject to the mitigation measures and requirements in the 2003 LRDP EIR. As described above, the Project would not result in a substantial increase in overall surface runoff and the inclusion of a storm water detention basin would reduce impacts to water quality, flooding, and erosion. Therefore, the contribution of the Project to changes in drainage patterns would not be cumulatively considerable. This impact was adequately analyzed in the 2003 LRDP EIR and was fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. Because the Project is within the scope of development under the 2003 LRDP and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter this previous analysis or conclusion.

e) The 2003 LRDP EIR found that implementation of the 2003 LRDP would alter drainage patterns in the Project area and would increase impervious surfaces, which could exceed the capacity of storm water drainage systems and result in localized flooding and contribution to off-site flooding (LRDP

Impact 4.8-3). The Project is not located within the floodway designated by the California Department of Water Resources and is not within 10 feet of the levees along the South Fork of Putah Creek. The Project would remove existing greenhouses and support structures on the Orchard Park Greenhouses site and construct greenhouses, support structures, utilities, parking, and access roads on the CORE 2 Project site. This would result in a reduction of impervious cover on the Orchard Park Greenhouses site and an increase in impervious cover on the CORE 2 Project site. Construction of the proposed storm water detention basin on CORE 2 Project site would increase on-site retention and decrease and treat run-off from the project site. As the on-site detention basin would reduce runoff and pollutants from the CORE 2 Project site, and the amount of runoff from the Orchard Park Greenhouses site would be reduced through removal of impervious cover, the Project would have no impact on water drainage systems.

The 2003 LRDP EIR also found that implementation of the 2003 LRDP in combination with regional development could alter drainage patterns and increase the rate or amount of surface runoff, which could cumulatively exceed the capacity of storm water drainage systems and result in flooding within the Putah Creek watershed (LRDP Impact 4.8-11). In most cases, this flooding would consist of temporary water ponding at storm drain inlets and along roads, and would not result in property damage or other serious consequences. With implementation of LRDP Mitigation 4.8- 11, which requires implementation of LRDP Mitigation 4.8-3, the 2003 LRDP EIR concluded that this cumulative impact would be less than significant. As stated above, the Project would not increase the rate of surface water runoff and would not cumulatively contribute to flooding. Because the Project is within the scope of development under the 2003 LRDP and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter this previous analysis or conclusion.

Storm water runoff pollution is evaluated further in items (a, f) and (c) above.

g,h) Under the 2003 LRDP, housing (including on-campus student housing and housing within the proposed neighborhood) would be constructed outside the 100-year flood zones on the campus (see 2003 LRDP EIR, Figure 4.8-4, 100-Year Floodplain). The Project does not include housing and therefore, no impact would occur.

i) The campus is located approximately 23 miles downstream of the Monticello Dam (forming Lake Berryessa) and approximately 15 miles downstream of the Putah Diversion Dam. An inundation study prepared by the U.S. Bureau of Reclamation shows that, in the highly unlikely case of a dam breach, the campus (as well as the City of Davis) would be inundated under a maximum of 3 to 9 feet of water approximately 3.5 to 4 hours following the breach (USBR 1998). However, the probability of such a release is far less than one in one million (USBR 2000). As of June 2000, Monticello Dam was determined to be in satisfactory condition, and the dam exhibited no unusual cracks, seeps, or deformations. In addition, the State Department of Dam Safety evaluates dams regularly, which would give adequate time to respond to any deterioration in the safety of the structure. Therefore, the impact associated with risk of flooding on campus as a result of a dam failure is considered to be less than significant.

j) The campus is not subject to inundation by seiche, tsunami, or mudflow. The campus is generally flat and is not located in close proximity to any large water bodies. Therefore, no impact would occur.

6.10 LAND USE & PLANNING

6.10.1 Background

Section 4.9 of the 2003 LRDP EIR addresses the land use and planning effects of campus growth under the 2003 LRDP. The following discussion summarizes information presented in the ‘Setting’ subsection of Section 4.9 of the 2003 LRDP EIR.

Environmental Setting

The Project site is located within the UC Davis central campus. The UC Davis campus consists of four general units: the central campus, the south campus, the west campus, and Russell Ranch. In addition, the University of California owns several properties in the City of Davis, buildings in downtown Davis and buildings and vacant parcels in the South Davis Research Park, located south of I-80. The City of Davis is a university-oriented community with over 62,000 residents.

The 2003 LRDP is the campus’ primary land use planning guide. It designates campus lands for the following uses: *Academic and Administrative* (High and Low Density); *Teaching and Research Fields*; *Teaching and Research Open Space*; *Parking*; *Physical Education, Intercollegiate Athletics, and Recreation* (PE/ICA/Recreation); *Research Park* (High and Low Density); *Formal Open Space*; *Community Gardens*; *Faculty/Staff Housing*, *Student Housing*; *Mixed Use Housing*; and *Elementary School*.

Project Site

The Core 2 Project site, located in the central campus, is designated primarily as *Academic/Administrative High Density*, with the western-most portion of the Project site designated as *Teaching and Research Fields* by the 2003 LRDP. The Orchard Park Greenhouses site is designated as *Student Housing* by the 2003 LRDP.

The 2003 LRDP identifies the *Academic/Administrative High Density* land use category as typically intended for large, multi-story buildings that support teaching, research, and public service activities. Examples of these buildings include classrooms, research laboratories and research support areas, faculty, staff, and student offices, libraries, student activity space, meeting rooms, space for public service, and outreach and cultural activities. The *Teaching and Research Fields* category is applicable to lands that support teaching, research and academic programs primarily in the plant and animal sciences. Teaching and Research lands typically do not include large buildings but can include agricultural-related buildings and facilities on sites smaller than two acres. The 2003 LRDP indicates that the *Student Housing* land use designation allows for student housing and support facilities.

6.10.2 2003 LRDP EIR Standards of Significance

The 2003 LRDP EIR considers a land use and planning impact significant if growth under the 2003 LRDP would:

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.
- Result in development of land uses that are substantially incompatible with existing adjacent land uses or with planned uses.
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

An additional standard from the CEQA Guidelines’ Environmental Checklist (“a” in the checklist below) was found not applicable to campus growth under the 2003 LRDP.

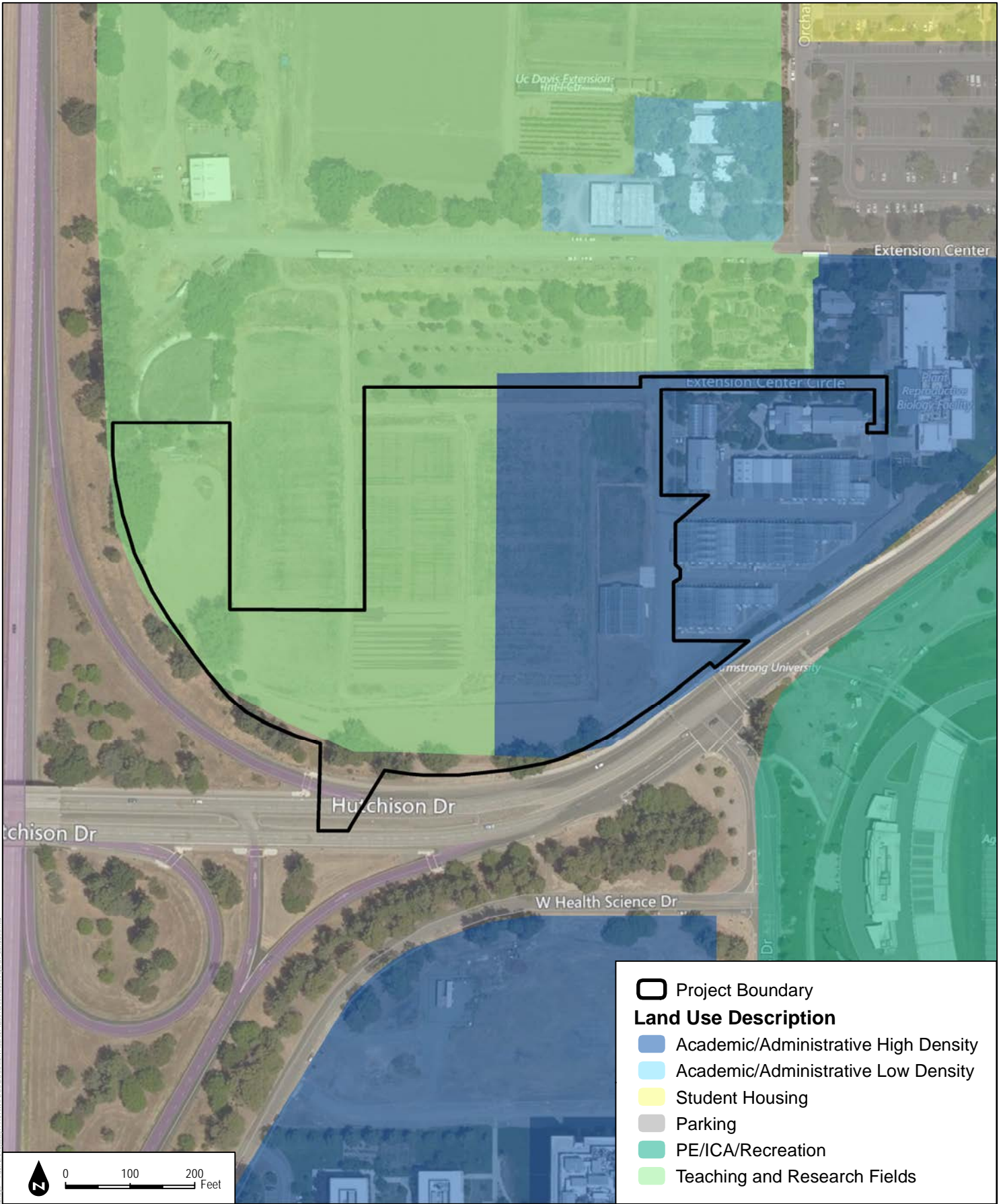
6.10.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP related to land use and planning are evaluated in Section 4.9 of the 2003 LRDP EIR. As analyzed in Section 4 of this Initial Study, the Project is within the scope of analysis in the 2003 LRDP EIR. The 2003 LRDP EIR did not identify any potentially significant or significant land use and planning impacts. The less-than-significant land use and planning impacts identified in the 2003 LRDP EIR do not require mitigation.

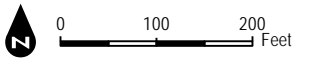
2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
LAND USE AND PLANNING			
4.9-4	Implementation of the 2003 LRDP, together with the cumulative impacts of other regional growth, would not conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the project that was adopted for the purpose of avoiding or mitigating an environmental effect.	LS	LS

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

INTENTIONALLY LEFT BLANK



- Project Boundary
- Land Use Description**
- Academic/Administrative High Density
- Academic/Administrative Low Density
- Student Housing
- Parking
- PE/ICA/Recreation
- Teaching and Research Fields



SOURCE: Bing Maps (Accessed 2017); Yolo County GIS; UC Davis (2006)

FIGURE 7

Core 2 Greenhouse LRDP Land Use Map



UC Davis Greenhouse Project

FILE: 101872017... Last saved by: es... P:\... UC Davis Greenhouse Project - Land Use Map

INTENTIONALLY LEFT BLANK

6.10.4 Environmental Checklist and Discussion

LAND USE & PLANNING	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...					
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in development of land uses that are substantially incompatible with existing adjacent land uses or with planned uses?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) The Project would have no potential to physically divide an established community. The Project would demolish existing greenhouses and support structures on the Orchard Park Greenhouses site and construct new greenhouses, support buildings, utilities, parking and access roads on the CORE 2 Project site. The design of the CORE 2 Project site would connect to existing pedestrian and vehicle access routes along Hutchison Drive and surrounding the Project site. Existing access to the Orchard Park Greenhouses site would be maintained by the Project. No impact would occur.

b,d) The applicable land use plan for the campus is the 2003 LRDP. The majority of the CORE 2 Project site is designated as *Academic/Administrative High Density*, with the remainder of the CORE 2 Project site designated as *Teaching and Research Fields*. The Orchard Park Greenhouses site is designated as *Student Housing*. Existing greenhouses on the Orchard Park Greenhouses site are inconsistent with the *Student Housing* land use designation. *Academic/Administrative High Density* uses allow large buildings that support teaching and research field facilities. The proposed CORE 2 Phase I greenhouses would be consistent with this land use designation and with removal of existing greenhouses, the Orchard Park Greenhouses site would be consistent with its designated land use. Therefore, the Project would not conflict with the 2003 LRDP or the LRDP Land Use Map, and the impact would be less than significant.

Impact 4.9-4 of the 2003 LRDP EIR stated that implementation of the 2003 LRDP and the cumulative impacts of other regional growth may result in development and land use planning pressures for other cities in the surrounding region. However, the 2003 LRDP EIR concluded that these cumulative impacts would be less than significant. The Project would demolish existing greenhouses within the existing Orchard Park Greenhouses site and add new greenhouses and structures within the existing CORE 2 Project site in the central campus, consistent with the 2003 LRDP land use designations. Because the Project is within the scope of development under the 2003 LRDP and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter this previous analysis or conclusion.

c) The campus does not fall within the boundaries of, nor is it adjacent to, an adopted regional HCP or NCCP. The campus has implemented two low effects HCPs for VELB at Russell Ranch. The Project is

not located at Russell Ranch and therefore, no impact would occur related to conflict with an applicable HCP or NCCP.

6.11 MINERAL RESOURCES

6.11.1 Background

Section 4.6, Geology, Soils, and Seismicity, of the 2003 LRDP EIR briefly addresses mineral resources issues. The 2003 LRDP EIR concludes that development on the campus would not impede extraction or result in the loss of availability of mineral resources.

Natural gas is the only known or potential mineral resource that has been identified on the campus. Natural gas can be extracted at wells placed considerable distances from deposits. No other known or potential mineral resources have been identified on the UC Davis campus. Therefore, development on the campus would not impede extraction or result in the loss of availability of mineral resources.

6.11.2 2003 LRDP EIR

Because development on the campus would not impede extraction or result in the loss of availability of mineral resources, the 2003 LRDP EIR did not identify any standards of significance, impacts, or mitigation measures associated with mineral resources. As analyzed in Section 4 of this Initial Study, the Project is within the scope of analysis in the 2003 LRDP EIR.

6.11.3 Environmental Checklist and Discussion

MINERAL RESOURCES	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...					
a) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, b) Natural gas is the only known or potential mineral resource that has been identified on the campus. Natural gas can be extracted at wells placed considerable distances from deposits. Additionally, the Orchard Park Greenhouses site is currently developed with greenhouses and support structures, and the CORE 2 Project site is in use as an agricultural research/teaching facility and is developed with the Tall Corn greenhouse building. The Project sites do not serve as a mineral resource recovery site. Therefore, redevelopment on the Project site would not impede extraction or result in the loss of availability of a known mineral resource and no impact would occur.

6.12 NOISE

6.12.1 Background

Section 4.10 of the 2003 LRDP EIR addresses the noise effects of campus growth under the 2003 LRDP. The following discussion summarizes information presented in the ‘Setting’ subsection of Section 4.10 of the 2003 LRDP EIR.

Environmental Setting

The primary noise source in the vicinity of the campus is vehicular traffic using I-80, SR 113, and local roads. Other sources of noise include occasional aircraft over-flights associated with the University Airport located on the west campus and another small airport in the vicinity, agricultural activities, railroads, and landscaping activities. Land use surrounding the campus is primarily agricultural, with residential, commercial, and other uses concentrated along the northern and eastern boundaries of the main campus.

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB), and the decibel scale adjusted for A-weighting (dBA) is a special frequency-dependent rating scale that relates to the frequency sensitivity of the human ear. Community noise usually consists of a base of steady “ambient” noise that is the sum of many distant and indistinguishable noise sources, as well as more distinct sounds from individual local sources. A number of noise descriptors are used to analyze the effects of community noise on people, including the following:

- L_{eq} , the equivalent energy noise level, is the average acoustic energy content of noise, measured during a prescribed period, typically one hour.
- L_{dn} , the Day-Night Average Sound Level, is a 24-hour-average L_{eq} with a 10 dBA “penalty” added to noise occurring during the hours of 10:00 PM to 7:00 AM to account for greater nocturnal noise sensitivity.
- CNEL, the Community Noise Equivalent Level, is a 24-hour-average L_{eq} with a “penalty” of 5 dB added to evening noise occurring between 7:00 PM and 10:00 PM, and a “penalty” of 10 dB added to nighttime noise occurring between 10:00 PM and 7:00 AM.

Noise monitoring over a 24-hour period in 2003 at sites located in urban areas on and adjacent to the campus (including areas next to freeways, roads, residences, and academic buildings) reflected CNEL levels ranging from 63 to 65 dBA CNEL. Ambient noise levels measured over a short period at various urban sites on the campus varied from 49 to 63 dBA L_{eq} .

Project Site

The Project includes demolition of a collection of greenhouses and other building structures located on the University of California, Davis Campus at the Orchard Park Greenhouses site. The Project would also construct greenhouses and associated structures on the CORE 2 Project site.

The CORE 2 Project site is located in the central campus, between Extension Center Drive and Hutchison Drive. The CORE 2 Project site contains agricultural research/teaching fields and the existing Tall Corn greenhouse building and is surrounded by similar academic uses, including existing CORE greenhouses and the Bowley Plant Science Teaching Facility to the east, the UC Davis Health Sciences area to the south, and agricultural teaching/research fields to the north. The site is located approximately 0.03 miles east of Highway 113 and approximately 0.2 miles east of the West Village student housing community.

The Orchard Park Greenhouses site is located southeast of Orchard Park Road and Orchard Road. The Orchard Park Greenhouses site is primarily surrounded by student housing and services and contains greenhouses and support structures. The Baggins End Domes residential area is located across Orchard Park Drive from the project site. A student wellness center is located to the east of the project site. The La Rue Apartments are located on the other side of a small parking lot to the south of the project site. Other residential areas are located north of the project site across Orchard Road.

A noise study was conducted by Dudek in April 2017 for the Project, which analyzed the existing noise environment in vicinity of the Orchard Park Greenhouses site. The sound levels were measured on and near the Orchard Park Greenhouses site through four short-term noise measurements and two long-term noise measurements. A description of the location of each noise measurement and the recorded A-weighted sound levels are provided in Table 7-6, Existing Noise Environment. Figure 8 displays noise measurement locations. The nearest noise sensitive receivers to the Orchard Park Greenhouses site are located to the west of the Project site in the domes structures, approximately 75 feet from the project boundary and approximately 390 feet from the center of the project site. As no noise sensitive receptors are present near the CORE 2 Greenhouses site, a noise study was not conducted for this site.

Noise levels measured at the Orchard Park Greenhouses site were conducted during the spring academic quarter. The school was in normal operation during the noise measurements. A copy of the Noise Analysis Memorandum is included in **Appendix C**.

**Table 7-6
Existing Noise Environment**

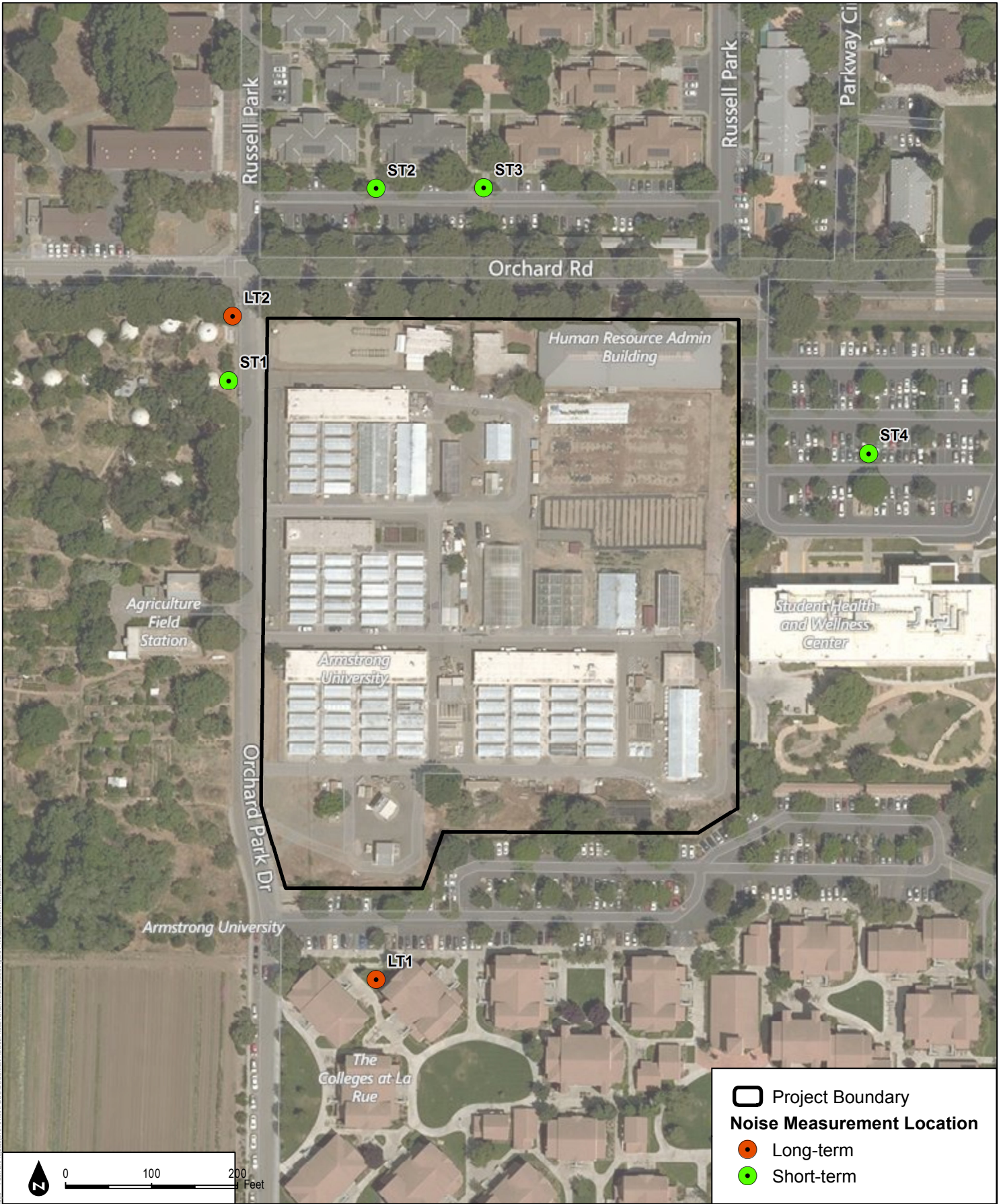
Measurement	Distance to Roadway Edge	L_{eq}^1	
<i>Short-Term Noise Measurements</i>			
ST1	14 feet	53	
ST2	7 feet	51	
ST3	7 feet	47	
ST4	10 feet*	52	
<i>Long-Term Noise Measurements (8 hour averages)</i>			
Site	Daytime Average Noise Levels 8a.m.-4p.m. $L_{eq(8hr)}$	Evening Average Noise Levels 4p.m.-12a.m. $L_{eq(8hr)}$	Nighttime Average Noise Levels 12a.m.- 8a.m. $L_{eq(8hr)}$
LT1	47	44	50
LT2	53	52	49

Notes:

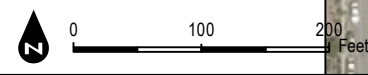
¹ Equivalent Continuous Sound Level (Time-Average Sound Level)

* distance to centerline of parking lot aisle

** Temperature: 59° Fahrenheit, cloudy, 12 miles-per-hour light/gusty south wind



- Project Boundary
- Noise Measurement Location**
- Long-term
- Short-term



SOURCE: Bing Maps (Accessed 2017)



UC Davis Core 2 Phase 1 Greenhouse Project

FIGURE 8
Noise Measurement Locations

INTENTIONALLY LEFT BLANK

6.12.2 2003 LRDP EIR Standards of Significance

The 2003 LRDP EIR considers a noise impact significant if growth under the 2003 LRDP would result in the following:

- Exposure of persons to or generation of noise levels in excess of levels set forth in **Table 7-7, Thresholds of Significance for Noise Evaluations**, of the 2003 LRDP EIR.

**Table 7-7.
Thresholds of Significance for Noise Evaluations**

Noise Source ^a	Criterion Noise Level ^b	Substantial Increase in Noise Level ^b
Road Traffic and Other Long-Term Sources	65 dBA CNEL	>=3 dBA if CNEL w/project is >= 65 dBA >=5 dBA if CNEL w/project is 50–64 dBA >=10 dBA if CNEL w/project is < 50 dBA
Construction (temporary)	80 dBA L _{eq (8h)} ^c daytime (7:00 a-7:00 p) 80 dBA L _{eq (8h)} evening (7:00 p-11:00 p) 70 dBA L _{eq (8h)} nighttime (11:00 p-7:00 a)	Not Applicable

Source: 2003 LRDP EIR

^a The 2003 LRDP would not substantially increase rail activity; therefore, a threshold of significance for rail noise is not included in this table.

^b At noise-sensitive land use unless otherwise noted. Noise-sensitive land uses include residential and institutional land uses.

^c L_{eq(8h)} is an average measurement over an eight-hour period.

- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- For a project 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, exposure of people residing or working in the project area to excessive noise levels.

6.12.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP related to noise are evaluated in Section 4.10 of the 2003 LRDP EIR. The Project is within the scope of analysis in the 2003 LRDP EIR and significant and potentially significant noise impacts identified in the 2003 LRDP EIR that are relevant to the Project are presented below with their corresponding levels of significance before and after application of mitigation measures identified in the 2003 LRDP EIR.

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
NOISE			
4.10-1	Construction of campus facilities pursuant to the 2003 LRDP could expose nearby receptors to excessive groundborne vibration and airborne or groundborne noise.	PS	LS
4.10-2	Implementation of the 2003 LRDP would result in increased vehicular traffic on the regional road network, which would substantially increase ambient noise	S	SU

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
NOISE			
levels at some locations.			
4.10-5	The 2003 LRDP development in combination with other regional development would increase ambient noise levels.	S	SU

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

Mitigation measures in the 2003 LRDP EIR that are applicable to the Project are presented below. Since these mitigation measures are already being carried out as part of implementation of the 2003 LRDP, they are considered part of the Project description and will not be readopted in this Initial Study or Negative Declaration. Nothing in this Initial Study in any way alters the obligations of the campus to implement 2003 LRDP EIR mitigation measures.

2003 LRDP EIR Mitigation Measures

NOISE

- 4.10-1 Prior to initiation of construction, the campus shall approve a construction noise mitigation program including but not limited to the following:
- Construction equipment shall be properly outfitted and maintained with feasible noise-reduction devices to minimize construction-generated noise.
 - Stationary noise sources such as generators or pumps shall be located 100 feet away from noise-sensitive land uses as feasible.
 - Laydown and construction vehicle staging areas shall be located 100 feet away from noise-sensitive land uses as feasible.
 - Whenever possible, academic, administrative, and residential areas that will be subject to construction noise shall be informed a week before the start of each construction project.
 - Loud construction activity (i.e., construction activity such as jackhammering, concrete sawing, asphalt removal, and large-scale grading operations) within 100 feet of a residential or academic building shall not be scheduled during finals week.
 - Loud construction activity as described above within 100 feet of an academic or residential use shall, to the extent feasible, be scheduled during holidays, Thanksgiving breaks, Christmas break, Spring break, or Summer break.
 - Loud construction activity within 100 feet of a residential or academic building shall be restricted to occur between 7:30 AM and 7:30 PM.
- 4.10-2(a) For noise-sensitive uses adjacent to Russell Boulevard between Arlington Boulevard and Arthur Street, the existing soundwall (approximately 6.5 feet in height) could be increased slightly in height and extended to include the daycare center to the east. For noise-sensitive uses adjacent to Russell Boulevard between Arthur Street and SR 113, and from SR 113 to La Rue/Anderson Road and from La Rue Road to Oak Street, soundwalls may be constructed for exterior residential and recreational land uses within approximately 100 feet of the centerline of Russell Boulevard, where construction of such walls would not interfere with driveway access. The campus shall reimburse the City of Davis the campus' fair share of the cost of a City of Davis' noise abatement program for reducing interior noise levels in homes along Russell Boulevard that are significantly affected by noise from 2003 LRDP-related traffic growth. The campus' contribution to the City's noise abatement program could be used to extend sound walls as described above or for other noise abatement measures such as retrofit of homes. The campus' fair share shall be determined based on the volume of traffic added to Russell Boulevard by the campus as a result of 2003 LRDP implementation and the percentage that 2003 LRDP-related traffic increases constitute

2003 LRDP EIR Mitigation Measures

NOISE

of the average daily traffic on the roadway.

- 4.10-2(b) For components of the 2003 LRDP having future noise-sensitive land uses such as the Neighborhood and Research Park, building and area layouts shall incorporate noise control as a design feature; including increased setbacks, landscaped berms, and using building placement to shield noise-sensitive exterior areas from direct roadway views.
- 4.10-5 Implement LRDP Mitigations 4.10-1 and 4.10-2.

6.12.4 Environmental Checklist and Discussion

NOISE

Would the project...	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) 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, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a,c) The Project will generate noise during the demolition/construction phase and during the operational phase. Noise during demolition/construction is addressed below in item (d).

Noise sources from the new greenhouse buildings and associated structures would include mechanical equipment serving the greenhouses, and noise from vehicles entering the Project site. The Project would not increase the enrollment capacity at UC Davis and would not increase resident student trips. Vehicle trips to the CORE 2 Project site would occur a few times a day at most. Furthermore, no noise sensitive

receptors exist in the vicinity of the CORE 2 Project site. No operational noise would occur on the Orchard Park Greenhouses site. Therefore, the Project would result in a less than significant impact.

Impact 4.10-5 of the 2003 LRDP EIR recognized that development under the 2003 LRDP in combination with other regional development would cumulatively increase ambient noise levels. Cumulative development would increase the number of people in the region who would be exposed to temporary construction-related noise. LRDP Mitigation Measure 4.10-5 requires application of the recommended noise control measures detailed in LRDP Mitigation Measure 4.10-1. LRDP Mitigation Measure 4.10-5 also requires the application of LRDP Mitigation Measure 4.10-2, which includes recommended noise control measures to mitigate for noise generated by vehicle traffic. The 2003 LRDP EIR found that, with mitigation, the cumulative impact associated with construction noise would be less than significant. As described above, the Project would have a less than significant impact on ambient noise levels. Because the Project is within the scope of development under the 2003 LRDP and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter this previous analysis or conclusion.

b,d) The nearest noise sensitive receivers include the Baggins End Domes structures, approximately 75 feet to the west of the Orchard Park Greenhouses site boundary and about 390 feet from the center of the Project site. The La Rue Apartments are located approximately 220 feet to the south of the Orchard Park Greenhouses site boundary, and other residential areas are located approximately 250 feet to the north of the Orchard Park Greenhouses site across Orchard Road. No sensitive receptors exist in the vicinity of the CORE 2 Project site.

Construction of the Project would not require unusual construction techniques such as pile driving, or blasting. The 2003 LRDP EIR found that construction of campus facilities pursuant to the 2003 LRDP could expose nearby receptors to excessive groundborne vibration and airborne or groundborne noise (LRDP Impact 4.10-1). Construction under the 2003 LRDP, including the Project, would require temporary construction activities using conventional construction techniques and equipment that would not generate substantial levels of vibration or groundborne noise. Routine noise levels from conventional construction activities (with the normal number of equipment operating on the site) range from 75 to 86 dBA Leq at a distance of 50 feet, from 69 to 80 dBA Leq at a distance of 100 feet, from 55 to 66 dBA Leq at a distance of 500 feet, and 48 to 60 dBA Leq at a distance of 1,000 feet (although noise levels would likely be lower due to additional attenuation from ground effects, air absorption, and shielding from miscellaneous intervening structures). Project noise from the demolition of existing greenhouses on the Orchard Park Greenhouses site was modeled using the Federal Highway Administration (FHWA) Roadway Construction Noise Model. Based on this modeling, temporary demolition noise would not be above the significance criteria of 80 dBA Leq daytime and evening. The noise analysis determined that the worst case noise level during demolition activities at the Orchard Park Greenhouses site would be 79.4 dBA at 65 feet from the Project site.

While daytime construction noise levels were calculated to be less than significant, evening or nighttime construction activity could still result in nuisance. With lower ambient noise levels in the evening and at night, the construction noise would be more noticeable in these periods, and would also have a greater potential to be disruptive for residences in the project vicinity. Consequently, construction activity in the period between 10 PM and 7 AM would result in a potentially significant short-term noise impact. This potentially significant impact would be avoided with adherence to required mitigation measures from the LRDP EIR (2003). LRDP Mitigation 4.10-1, included in the Project, would reduce construction noise by requiring that loud construction activity within 100 feet of residential buildings occur only between 7:30 AM and 7:30 PM and not occur during finals week. When feasible, loud construction activity would be scheduled during holidays when students will not be studying or will not be on the campus.

The 2003 LRDP EIR also recognized that development under the 2003 LRDP in combination with other regional development would cumulatively increase ambient noise levels (LRDP Impact 4.10-5). Cumulative development would increase the number of people in the region who would be exposed to temporary construction-related noise. LRDP Mitigation 4.10-5, included as part of the Project, would require application of the recommended noise control measures detailed in LRDP Mitigation 4.10-1. The 2003 LRDP EIR found that, with this mitigation, the cumulative impact associated with construction noise would be less than significant. LRDP Impact 4.10-2 addresses traffic noise impacts on and adjacent to the campus associated with the 2003 LRDP and cumulative growth. The Project would not add substantial traffic to the Project area, the Project staffing levels are consistent with LRDP staffing levels, and the Project's potential contribution to cumulative vehicle traffic noise has been adequately addressed in the LRDP EIR.

e) The CORE 2 Project site is approximately 1.2 miles northeast of the University airport and the Orchard Park Greenhouses site is approximately 1.5 miles northeast of the University airport. The 2003 LRDP, including the Project, does not propose changes to University Airport operations, nor does it propose occupied uses within the airport's 65 CNEL noise contour. Therefore, the Project would not expose people to excessive noise levels associated with this public use airport. There would be no impact.

f) The nearest airport, University Airport, is a public use airport. No private airport facilities are within the immediate vicinity of the campus. No impact would occur. Refer to item e) above for discussion of potential noise impacts associated with the campus' public use airports.

6.13 POPULATION & HOUSING

6.13.1 Background

Section 4.11 of the 2003 LRDP EIR addresses the population and housing effects of campus growth under the 2003 LRDP. The following discussion summarizes information presented in the 'Setting' subsection of Section 4.11 of the 2003 LRDP EIR.

The on-campus population at UC Davis includes students, faculty/staff, and non-UC Davis affiliates working on campus. The current and projected campus population figures are presented in the Project description of this Tiered Initial Study. As of 2003, approximately 80 percent of the student population and 50 percent of the employee population lived in the Davis area, and approximately 94 percent of students and 90 percent of employees lived within the three-county area of Yolo, Solano, and Sacramento counties. Outside the City of Davis, the predominant residence locations of students and employees are Woodland, West Sacramento, Winters, Dixon, Vacaville, and Fairfield (UC Davis ORMP 2003a).

Vacancy rates in the City of Davis are considered low, and housing costs in the City are generally higher than those elsewhere in the region. Since 1994, the campus has been working toward the goals of maintaining a UC Davis housing supply that can accommodate 25 percent of the on-campus enrolled students and can offer housing to all eligible freshmen. The 2003 LRDP focuses on providing additional on-campus student housing that will accommodate a total of approximately 7,800 students on the core campus (or 26 percent of the peak student enrollment through 2015-16) and an additional 3,000 students in a west campus neighborhood. The campus currently offers one faculty and staff housing area (Aggie Village), which includes 21 single-family units (17 of which have cottages) and 16 duplexes. The 2003 LRDP plans to provide an additional 500 faculty and staff housing units within the west campus neighborhood.

Project Site

The CORE 2 Project site is located in the central campus and contains agricultural research/teaching fields and the existing Tall Corn greenhouse building. The Orchard Park Greenhouses site is located southeast of Orchard Park Road and Orchard Road and contains greenhouses and support structures. No housing is present on the Project sites, and no housing would be constructed as a result of the Project.

6.13.2 2003 LRDP EIR Standards of Significance

The 2003 LRDP EIR considers an impact related to population and housing significant if growth under the 2003 LRDP would:

- Directly induce substantial population growth in the area by proposing new housing and employment.
- Create a demand for housing that could not be accommodated by local jurisdictions.
- Induce substantial population growth in an area indirectly (for example, through extension of roads or other infrastructure).

Additional standards from the CEQA Guidelines' Environmental Checklist ("b" and "c" in the checklist below) were found not applicable to campus growth under the 2003 LRDP.

6.13.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP related to population and housing are evaluated in Section 4.11 of the 2003 LRDP EIR. As discussed in Section 7.13.4, below, the Project will not impact population levels. For this reason, mitigation measures identified in the 2003 LRDP EIR are not relevant to the Project.

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
POPULATION AND HOUSING			
4.11-3	Implementation of the 2003 LRDP and other regional development would not create a demand for housing that could not be accommodated by local jurisdictions.	LS	LS

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

6.13.4 Environmental Checklist and Discussion

POPULATION & HOUSING	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...					
a) Induce substantial 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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a demand for housing that cannot be accommodated by local jurisdictions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a) The Project would not induce population growth. The Project would involve demolition of existing greenhouses on the Orchard Park Greenhouses site and construction of new greenhouses, support structures, utilities, limited parking, access roads, a soil area, and detention pond on the CORE 2 Project site. New greenhouses and associated development would serve existing students and other members of the existing campus population. As existing greenhouses at the Orchard Park site would be demolished in phases while new greenhouses are constructed at the CORE 2 site, a large increase in greenhouse space would not occur. Furthermore, all utilities, parking, and access roads would support the Project site and would not result in the extension of resources that could promote growth within the Project area. The proposed greenhouses on the CORE 2 site would require support from approximately 10 greenhouse staff. These staff would likely come from the existing student employee population or from the existing work force in the area would not result in substantial population growth in the region. Therefore, the Project would not increase campus enrollment and would not contribute to population growth or induce substantial population growth. The impact would be less than significant.

b,c) The Project would not permanently displace any existing housing or people because no existing housing is located on the Project site. The student housing expansions in recent years have increased the overall availability of on- and off-campus housing so that current and future students have more available housing than existed a few years ago. No impact would occur.

d) The Project would not increase student enrollment and therefore would not increase the demand for student housing. Approximately 10 part-time greenhouse staff would support the CORE 2 site. Any new staff that would be required to support the proposed greenhouses would likely come from the existing campus greenhouses, the University student population, and/or the existing work force in the region and therefore would not create substantial demand for new housing. The impact related to housing demand would be less than significant.

Impact 4.11-3 of the LRDP EIR concluded that development under the 2003 LRDP, in conjunction with other development in the region, would not result in significant cumulative impacts related to housing demand. As described above, the Project would not induce population growth, increase student enrollment, or permanently displace existing housing. Because the Project is within the scope of development under the 2003 LRDP and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter this previous analysis or conclusion.

6.14 PUBLIC SERVICES

6.14.1 Background

Section 4.12 of the 2003 LRDP EIR addresses the public services effects of campus growth under the 2003 LRDP. The following discussion summarizes information presented in the ‘Setting’ subsection of Section 4.13 of the 2003 LRDP EIR, updated with more recent information as appropriate.

In accordance with the CEQA Guidelines, the public services analysis below evaluates the environmental effects associated with any physical changes required to meet increases in demand for public services, including police, fire protection, schools, and libraries. Project-level public services impacts are addressed by evaluating the effects of the increased population on public services that directly serve the project site and its residents. Cumulative public services impacts are addressed by evaluating the effects of off-campus population growth on the public services in the Cities of Davis, Dixon, Winters, and Woodland.

UC Davis provides most public services needed on the campus, including fire protection, police protection, and library services. Since the Project is located on-campus, police and fire protection would be provided by UC Davis. The Davis Joint Unified School District (DJUSD) serves the City of Davis and portions of Yolo and Solano counties. These services are discussed further below:

- **Fire Protection:** The UC Davis Fire Department provides fire protection, hazardous materials incident response, and emergency medical service to the campus. The UC Davis Fire Department employs 25 full-time personnel in addition to one part-time administrative assistant, 15 student resident firefighters, and one student administrative support staff (UC Davis Fire Department 2016). The fire department's goal is to respond to 90 percent of campus emergency calls within 6 minutes (Trauernicht 2010). As of 2008, the UC Davis Fire Department achieves its stated standard of response (Trauernicht 2010).
- **Police:** Law enforcement services are provided to the Project site by the UC Davis Police Department. The campus Police Department provides police protection services to all buildings and facilities either owned or leased by UC Davis. The campus Police Department employs 48-sworn officers, 70 professional staff, and 130 student support staff (University of California Regents 2016). Although the campus does not currently rely on any level-of service standards, the Police Department has indicated that it would like to reach and maintain 1 sworn officer per 1,000 persons on the UC Davis campus. The Police Department is currently staffed at a level of approximately 0.5 officers per 1,000 persons on the Davis Campus (Souza 2010).
- **Schools:** In 2001-02 a total of approximately 8,677 students were enrolled in the DJUSD's nine elementary schools, two junior high schools, one high school, one continuation high school, and one independent study program. The DJUSD estimates student enrollment based on a rate of 0.69 student per single-family residential unit and 0.44 student per multi-family residential unit in its service area. Since 2003, enrollment has decreased slightly with a total enrollment of 8,539 students in the 2013-2014 academic year (Ed-Data 2014).
- **Libraries:** UC Davis currently has four main libraries, distributed among the academic centers of the central campus, which serve students, faculty, staff, and the general public, including Shields Library (the main campus library located centrally on the core campus), the Carlson Health Sciences Library, the Law Library, and the Physical Sciences and Engineering Library. The Davis library, a branch of the Yolo County Library, is located in the City of Davis.

Project Site

The CORE 2 Project site is located in the central campus and contains agricultural research/teaching fields and the existing Tall Corn greenhouse building. The Orchard Park Greenhouses site is located southeast of Orchard Park Road and Orchard Road and contains greenhouses and support structures. Police and fire services are provided by UC Davis.

6.14.2 2003 LRDP EIR Standards of Significance

The 2003 LRDP EIR considers a public services impact significant if growth under the 2003 LRDP would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services.

Effects associated with recreation services are evaluated in Section 7.15, Recreation, and effects associated with the capacity of the domestic fire water system to provide adequate fire protection are evaluated in Section 7.17, Utilities.

6.14.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP on public services are evaluated in Section 4.12 of the 2003 LRDP EIR.

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
PUBLIC SERVICES			
4.12-6	Implementation of the 2003 LRDP, in conjunction with regional growth, could generate a cumulative demand for new or expanded police and fire service facilities in the region, the construction of which could result in significant adverse environmental impacts to prime farmland and habitat.	S	SU
4.12-7	Implementation of the 2003 LRDP, in conjunction with regional growth, would increase the number of school-age children living in the area. This could generate a cumulative demand for new school facilities, the construction of which could result in significant environmental impacts to agricultural prime farmland and habitat.	S	SU
4.12-8	Implementation of the 2003 LRDP and other regional development would increase the population of the area, which could generate a cumulative demand for new libraries, the construction of which would not result in significant environmental impacts.	LS	LS

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

6.14.4 Environmental Checklist and Discussion

PUBLIC SERVICES	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...					
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:					
i) Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

PUBLIC SERVICES	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...					
iii) Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
v) Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a, i&ii) UC Davis Fire and Police Protection

The Project would not increase the enrollment at UC Davis or the regional population levels. New greenhouses and support structures constructed on the CORE 2 site would replace greenhouses and structures that would be demolished on the Orchard Park Greenhouses site. Fire and police services are already provided to the Project site by UC Davis and construction of the Project is not expected to significantly increase demand for fire and police protection such that new or expanded facilities would be required. The impact is less than significant.

Regional Fire and Police Protection

The Project would not increase the student population at UC Davis or in the surrounding community. Approximately 10 greenhouse staff would support the CORE 2 site. These staff are likely to come from the existing student employee population or the region’s existing work force. Therefore, there would not be a substantial increase in the population in the City requiring fire and police services. The Project would not significantly increase demand for fire and police protection in the City such that new or expanded facilities would be required. The impact is less than significant.

a, iii) **Schools**

The Project site does not provide housing and would not likely generate school-age children that would require services from the DJUSD. The impact is less than significant.

a, iv) Effects associated with parks are evaluated in Section 7.15, Recreation.

a, v) **Libraries**

The Project would not increase the on- or off-campus residential population because the Project site does not include residential uses. While the Project would increase the number of UC Davis staff, the majority of these new staff would come from the existing work force in the area and therefore would not likely increase the utilization of school libraries or local public libraries. The impact is less than significant.

Cumulative Impacts

The LRDP-related off-campus population, in conjunction with other regional development, would contribute to increased demands for public services in Davis, Dixon, Woodland, and Winters. New population in these communities would not be added at one time, but over the life of the 2003 LRDP. The LRDP-associated population would contribute to the growth anticipated by each jurisdiction in its respective General Plan. Implementation of the 2003 LRDP, in conjunction with regional growth, could generate a cumulative demand for new or expanded police and fire service facilities in the region, the construction of which could result in significant and unavoidable adverse environmental impacts to prime farmland and habitat (Impact 4.12-6).

Implementation of the 2003 LRDP, in conjunction with cumulative growth in the region, would increase demand for school facilities; construction of new schools in the Cities of Davis, Winters, Dixon, and Woodland could result in development of agricultural areas, which could result in the significant and unavoidable loss of prime farmland and habitat (Impact 4.12-7). Impact 4.12-8 determined that the campus population in general would result in a less-than-significant cumulative impact on regional libraries because campus-related population would have easy access to the campus libraries.

These cumulative impacts were adequately analyzed in the 2003 LRDP EIR and fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. Because the proposed Project is within the scope of development under the 2030 LRDP and existing conditions related to public services have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter the previous analysis or conclusions.

6.15 RECREATION

6.15.1 Background

Section 4.13 of the 2003 LRDP EIR addresses the environmental effects associated with modifying recreational resources to meet campus growth under the 2003 LRDP. The following discussion summarizes information presented in the ‘Setting’ subsection of Section 4.13 of the 2003 LRDP EIR.

UC Davis contains many park-like areas and recreation facilities. Park facilities at UC Davis range in size from small picnic and landscaped areas within campus housing areas to extensively landscaped areas in the academic core of the central campus, such as the Arboretum. Areas such as the Quad, the landscaped areas along A Street and Russell Boulevard, the Putah Creek Riparian Reserve in the west campus, and many areas within the Arboretum are used regularly by members of the UC Davis campus and visitors to the campus.

Recreation facilities on the campus include structures, bike paths, and fields used for physical education, intercollegiate athletics, intramural sports, sports clubs, and general recreation. Recreation structures include Hickey Gym, Recreation Hall, the Recreation Swimming Pool, Recreation Lodge, Activities and Recreation Center, and the Schaal Aquatic Center. The general public may purchase privilege cards to use some campus recreation facilities, or may join community or campus organizations that have access to some facilities.

Project Site

The CORE 2 Project site contains research/teaching fields and the existing Tall Corn greenhouse building. The Orchard Park Greenhouses site contains existing greenhouses and support structures. No recreational facilities occur on the Project sites.

6.15.2 2003 LRDP EIR Standards of Significance

The 2003 LRDP EIR considers a recreation impact significant if growth under the 2003 LRDP would:

- Increase the use of existing neighborhood and regional parks or other recreation facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Propose the construction of recreation facilities or require the expansion of recreation facilities, which might have an adverse physical effect on the environment.

6.15.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP associated with recreation are evaluated in Section 4.13 of the 2003 LRDP EIR. As discussed in Section 7.15.4, below, the Project will not impact recreation resources.

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
RECREATION			
4.13-2	Implementation of the 2003 LRDP, together with the cumulative impacts of other regional development, could increase the use of off-campus recreation facilities, the development of which could result in significant environmental impacts.	S	SU

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

Mitigation measures in the 2003 LRDP EIR that are applicable to the Project are presented below. Since these mitigation measures are already being carried out as part of implementation of the 2003 LRDP, they are considered part of the Project description and will not be readopted in this Initial Study or Negative Declaration. Nothing in this Initial Study in any way alters the obligations of the campus to implement 2003 LRDP EIR mitigation measures.

2003 LRDP EIR Mitigation Measures	
RECREATION	
4.13-2	If documented unmitigated significant environmental impacts are caused by the construction of recreation facilities in the Cities of Dixon, Woodland, and/or Winters that are needed in part due to implementation of the 2003 LRDP, UC Davis shall negotiate with the appropriate local jurisdiction to determine the campus' fair share (as described in Section 4.12.2.3) of the costs to implement any feasible and required environmental mitigation measures so long as the unmitigated impacts have not been otherwise reduced to less-than-significant levels through regulatory requirements, public funding, or agreements. This mitigation measure shall not apply to any other costs associated with implementation of recreation facilities.

6.15.4 Environmental Checklist and Discussion

RECREATION	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...					
a) Would the project 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

RECREATION	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...					
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a,b) The Project would not demolish existing recreational facilities and would not construct new recreational facilities. The Project would remove existing greenhouses on the Orchard Park Greenhouses site and construct new greenhouses, support buildings, utilities, parking, access roads, a soil area, and detention pond on the CORE 2 Project site. The Project would not increase the resident population on-campus. While the Project would increase the number of UC Davis staff, the majority of these new staff would come from the existing work force in the area. The Project would not generate substantial additional off-campus population that would increase demand for off-campus parks and recreational facilities. Therefore, the increase in demand would not result in deterioration of recreational facilities. The impact is less than significant.

The LRDP-related population would place a demand on recreation facilities in Davis, Dixon, Winters, and Woodland, which would combine with effects stemming from other regional growth. Depending on specific park and recreation sites, development of recreation facilities to meet additional demands was determined in the 2003 LRDP EIR to result in potential impacts such as loss of prime farmland or loss of valuable habitat. The 2003 LRDP EIR concluded that it would be speculative for that EIR to arrive at the conclusion that the impacts would be less than significant. Therefore, the 2003 LRDP EIR concluded that the environmental impacts from the development of recreation facilities triggered by the cumulative demand in the region would be significant and unavoidable even with implementation of LRDP Mitigation 4.13-2. This impact was adequately analyzed in the 2003 LRDP EIR and fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. The Project is within the scope of development under the 2003 LRDP and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter this previous analysis or conclusion.

6.16 TRANSPORTATION & TRAFFIC

6.16.1 Background

Section 4.14 of the 2003 LRDP EIR addresses the transportation, circulation, and parking effects of campus growth under the 2003 LRDP. The following discussion summarizes information presented in the ‘Setting’ subsection of Section 4.14 of the 2003 LRDP EIR.

Environmental Setting

I-80 and SR 113 provide primary regional roadway access to the campus and the City of Davis.

Access to the campus from the City of Davis is provided primarily from A Street, B Street, First Street, and Russell Boulevard. UC Davis has six main campus roadways or “gateways” that connect the campus to residential and downtown areas in the City of Davis, and two gateways that provide direct access to I-80 and SR 113. Circulation within the central campus is accommodated primarily by the campus “loop” roadway system, which includes Russell Boulevard, A Street, New and Old Davis Roads, California

Avenue, and La Rue Road. Other roadways within the core campus area are restricted to transit and emergency vehicles, bicyclists, and pedestrians. Primary vehicular access to the south campus is provided by Old Davis Road, to the west campus by Hutchison Drive, and to Russell Ranch by Russell Boulevard.

Bicycles are a major component of the transportation system at UC Davis and in the City of Davis. UC Davis has an extensive system of bicycle paths, which makes bicycles a popular form of travel on campus. The UC Davis Bicycle Plan (UC Davis 2011a) estimates that 15,000 to 20,000 bicycles travel to the campus on a typical weekday during the Fall and Spring sessions when the weather is good. The most recent travel survey indicates that about 46 percent of UC Davis affiliates or 19,337 people commute by bicycle on a typical weekday.⁷ (UC Davis 2015b)

Parking at UC Davis is provided by a combination of surface lots and parking structures. UC Davis Transportation and Parking Services (TAPS) oversees parking services on campus including selling parking passes, providing traffic control at special events, ticketing violators, and measuring parking utilization throughout campus on a quarterly basis. In the 2014-2015 academic year approximately 24.5 percent of UC Davis students, staff and faculty purchased a parking permit (UC Davis 2015b).

The operations of roadway facilities are described with the term level of service (LOS). The Highway Capacity Manual (HCM) defines LOS as a qualitative measure, which describes the operational conditions of a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience. LOS is rated A through F, with LOS A representing the best operating conditions and LOS F representing the worst. LOS is measured during morning (7 to 9 AM) and afternoon (4 to 6 PM) peak commute times. The LOS of campus roadways varies. Monitoring of campus intersections during peak hours in Fall 2001 and Fall 2002 found that the Hutchison Drive/Health Sciences Drive intersection (with LOS E during the PM peak hour) was the only study intersection to operate below the campus' operation standard (standards are identified in the following section) and the campus installed a traffic signal at this intersection in 2006. In addition, the campus completed a roundabout at the intersection of Old Davis Road and South La Rue Road in 2011 to improve LOS (UC Davis 2014).

Project Site

Vehicular access to the CORE 2 Project site would be provided from Hutchison Drive to the south of the Project site and through access roads connecting to Extension Center Drive and Hutchison Drive. Additional access roads would be constructed as part of the Project to connect to the existing CORE access road. Access to the Orchard Park Greenhouses site is available from Orchard Park Drive, to the west of the Project site, and Parking Lot #35, to the east of the Project site. Vehicle access is provided throughout the Orchard Park Greenhouses site, as the majority of the site is paved. No vehicle access or parking currently exists on the CORE 2 Project site. Pedestrian and bicycle access are available on both sites.

6.16.2 2003 LRDP EIR Standards of Significance

The following standards of significance are based on the 2003 LRDP EIR. An impact to transportation/traffic would be considered significant if the Project:

- Conflicts with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation

⁷ Data is based on a weighted sample of 3,507 and a projected population of 42,405.

including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

- Pursuant to the 2003 LRDP EIR, LOS D is the minimum acceptable LOS for UC Davis intersection.
 - For signalized intersections, deteriorate peak hour intersection operations from an acceptable level (LOS D) to an unacceptable level (LOS E or worse).
 - For unsignalized intersections, deteriorate the average LOS of all movements from an acceptable level (LOS D) to an unacceptable level and meet the California Manual on Uniform Traffic Control Devices (MUTCD) peak hour signal warrant.
 - For signalized and unsignalized intersections that operate unacceptably without the project, the addition of 10 or more vehicles to the intersection’s volume.
 - Conflicts with an applicable congestion management program, including, but not limited to level of service standards established by the county congestion management agency for designated roads and highways.
 - Results in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
 - Substantially increases hazards due to a design feature (e.g., sharp curves or dangerous intersections) incompatible uses (e.g., farm equipment).
 - Results in inadequate emergency access.
 - Conflicts with applicable adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

6.16.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP on transportation and traffic are evaluated in Section 4.14 of the 2003 LRDP EIR. As analyzed in Section 4 of this Initial Study, the Project is within the scope of analysis in the 2003 LRDP EIR. Significant and potentially significant traffic and circulation impacts identified in the 2003 LRDP EIR that are relevant to the Project are presented below with their corresponding levels of significance before and after application of mitigation measures identified in the 2003 LRDP EIR. Mitigation is required to reduce the magnitude of project-level LRDP Impact 4.14-2, but these impacts are identified as significant and unavoidable because mitigation measures at the impacted facilities are under the jurisdiction of other agencies that may elect not to implement the recommended mitigation measures.

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
TRAFFIC AND CIRCULATION			
4.14-1	Implementation of the 2003 LRDP would cause unacceptable intersection operations at on-campus intersections.	S	LS
4.14-2	Implementation of the 2003 LRDP would cause unacceptable intersection and freeway LOS operations at off-campus facilities, including facilities contained in the Yolo County and Solano County Congestion Management Plans.	S	SU

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
TRAFFIC AND CIRCULATION			
4.14-4	Implementation of the 2003 LRDP would increase demand for transit services.	S	LS
4.14-5	Growth in population levels in the core area of the central campus would result in increased conflicts between bicyclists, pedestrians, and transit vehicles, causing increased congestion and safety problems.	S	LS

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

Mitigation measures in the 2003 LRDP EIR that are applicable to the Project are presented below. Since these mitigation measures are already being carried out as part of implementation of the 2003 LRDP, they are considered part of the Project description and will not be readopted. Nothing in this Initial Study in any way alters the obligations of the campus to implement 2003 LRDP EIR mitigation measures.

2003 LRDP EIR Mitigation Measures

TRAFFIC AND CIRCULATION

- | | |
|----------|--|
| 4.14-1 a | UC Davis shall continue to actively pursue Transportation Demand Management strategies to reduce vehicle-trips to and from campus. |
| 4.14-1 b | UC Davis shall continue to monitor AM and PM peak hour traffic operations at critical intersections and roadways on campus. |
| 4.14-1 c | UC Davis shall review individual projects proposed under the 2003 LRDP as they advance through the environmental clearance phase of development to determine if intersection or roadway improvements are needed with the additional traffic generated by the proposed project. If intersection operations are found to degrade to unacceptable levels, UC Davis shall construct physical improvements such as adding traffic signals or roundabouts at affected study intersections. |
| 4.14-2 a | UC Davis shall continue to actively pursue Transportation Demand Management strategies to reduce vehicle-trips to and from campus. |
| 4.14-2 b | UC Davis shall continue to monitor AM and PM peak hour traffic operations at critical intersections and roadways in the campus vicinity at least every three years to identify locations operating below UC Davis, City of Davis, Yolo County, Solano County, or Caltrans LOS thresholds and to identify improvements to restore operations to an acceptable level. |
| 4.14-2 c | UC Davis shall review individual projects proposed under the 2003 LRDP as they advance through the environmental clearance phase of development to determine if intersection or roadway improvements are needed with the additional traffic generated by the proposed project. If intersection operations are found to degrade to unacceptable levels, UC Davis shall contribute its fair share towards roadway improvements at affected study intersections. |
| 4.14-4 | UC Davis shall monitor transit ridership to identify routes operating over capacity with increased campus growth. UC Davis shall work with transit providers to identify additional service required with campus growth or new transit routes needed to serve future development areas. |
| 4.14-5 | UC Davis shall monitor core area pedestrian and bike activity and accidents. UC Davis shall improve bike and pedestrian facilities or alter transit operations to avoid increased bicycle accident rates or safety problems. |

6.16.4 Environmental Checklist and Discussion

TRANSPORTATION & TRAFFIC	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...					
a) Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards established by the county congestion management agency for designated roads and highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a,b) The Project would not increase regional population or student enrollment at UC Davis, and would support the existing and future campus population. According to the 2003 LRDP, about 85% of students living within the City of Davis or on the campus, and 13% of students living outside of Davis, use modes of travel other than a single occupancy vehicle to access locations on campus. Approximately 52% of faculty and staff living in the City of Davis, and 15% of faculty and staff residing outside of Davis, travel to campus using modes of travel other than a single occupancy vehicle. The CORE 2 Project site would require support from 10 staff during operation. These employees are likely to be students or residents that live within the City of Davis or on the campus. The CORE 2 Project site would be accessible to vehicles, and five parking spaces would be provided on the site. Visitors to the proposed greenhouse buildings and accompanying features would likely be staff, students, and researchers using the site for academic or research purposes, and not the general public. As the Project would not support considerable amounts of people on the Project site and would not induce significantly more vehicle trips to the Project site, a significant increase in vehicle traffic is not anticipated as part of the Project. The impact is less than significant.

Demolition of existing greenhouses and support structures and construction of new greenhouses and associated features with the Project would require vehicle trips to the Project sites. Vehicle access on roads surrounding the Project sites would be maintained during Project construction/demolition activities.

Pedestrian and bicycle access surrounding the Project sites would not be affected by the Project. Due to the limited and temporary increase in vehicles required for Project construction on roadways surrounding the Project sites, no additional congestion or impacts are anticipated as part of Project construction.

The 2003 LRDP EIR traffic analysis considered future conditions (2015) both with and without implementation of the 2003 LRDP. The analysis included consideration of planned transportation improvements as identified in the Metropolitan Transportation Plan for 2025 (Sacramento Area Council of Governments May 2002), also known as the MTP. The MTP is a federally mandated long-range transportation plan for the six-county area that includes El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba Counties. The analysis in Impact 4.14-2 of the 2003 LRDP EIR concluded that implementation of the 2003 LRDP would result in unacceptable intersection and freeway LOS operations at off-campus facilities, including facilities contained in the Yolo County and Solano County Congestion Management Plans. While mitigation measures would help reduce this impact, it was determined to be significant and unavoidable.

While the Project would create minimal direct vehicle trips, the Project is within the scope of development analyzed in the 2003 LRDP EIR and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, it is anticipated that impacts to transportation would not exceed those identified in the previous analysis.

c) The Project would not result in a change related to air traffic patterns. Impacts related to safety risks associated with the UC Davis airport are discussed in Section 7.8, Hazards and Hazardous Materials.

d,f) Bicycle and pedestrian access surrounding the Project sites would be maintained. Access roads connecting to the existing CORE driveway would be constructed on the CORE 2 Project site to provide vehicle, bicycle, and pedestrian access to the site. Dedicated bicycle parking could be added to the site with the Future Expansion phases. Access to the CORE 2 Project site would be available from Hutchison Drive to the south of the site, as well as from Extension Center Drive to the north of the site. The Project design would not include any features that would reduce the visibility of bicyclists near the Project sites and would not introduce hazardous design features. Therefore, the Project impact to bicycle and pedestrian facilities would be less than significant.

There are no recorded pedestrian or bicycle collisions, injuries or fatalities at or adjacent to the Project sites. There have been four recorded collisions on Hutchison Drive involving bicyclists in the last ten years.⁸ In accordance with LRDP Mitigation 4.14-5, UC Davis continues to monitor and improve circulation facilities on campus to avoid safety problems. In 2009, the campus completed the UC Davis Bikeway and Transit Network Study (BTNS) to identify long-term route improvements and facility upgrades for bikes, pedestrians, and transit vehicles. The Project would not conflict with the BTNS plan and is consistent with the 2003 LRDP.

e) Impacts related to emergency access are discussed in Section 7.8, Hazards and Hazardous Materials. Roadways would remain open to emergency vehicles during Project construction. No impact would occur.

⁸ Data is from the Statewide Integrated Traffic Records System (SWITRS). SWITRS is a database maintained by the California Highway Patrol that serves as a means to collect and process data gathered from a collision scene. The data is mapped online by the Safe Transportation Research and Education Center (SafeTREC) at the University of California, Berkeley. <http://tims.berkeley.edu/> (Accessed August 2016.)

6.17 UTILITIES & SERVICE SYSTEMS

6.17.1 Background

Section 4.15 of the 2003 LRDP EIR addresses the effects of campus growth on utility systems under the 2003 LRDP. The campus provides the following utility and service systems to campus projects:

- Domestic/Fire Water
- Utility Water
- Agricultural Water
- Storm Drainage
- Wastewater
- Solid Waste
- Chilled Water
- Steam
- Electricity
- Natural Gas
- Telecommunications

The campus is required to comply with a UC-wide green building policy and clean energy standard. The policy encourages principles of energy efficiency and sustainability in the planning, financing, design, construction, renewal, maintenance, operation, space management, facilities utilization, and decommissioning of facilities and infrastructure to the extent possible, consistent with budgetary constraints and regulatory and programmatic requirements. In addition, the policy aims to minimize increased use of non-renewable energy by encouraging programs addressing energy efficiency, local renewable power and green power purchases from the electrical grid (UC Office of the President 2003).

Project Site

The Project would use campus utilities and service systems, including domestic water, utility water, sanitary sewer, storm drainage, electricity, natural gas, chilled water, steam, and telecommunications. These utilities and service systems are discussed below:

- **Water:** The campus' domestic/fire water system obtains water from six deep aquifer wells to serve the needs of campus buildings, landscape irrigation on the west and south campuses, and heating and cooling systems at the Central Heating and Cooling Plant. Water service would consist of separate connections for domestic/fire supply and utility water. Domestic and fire protection service lines would connect to the existing 8-inch main along the existing driveway on the east side of the CORE 2 site. Services to the greenhouses (and support buildings) would be extended with adequate approved protections (i.e.: double check valves assembly, reduced pressure backflow protections, etc.). The firewater final layout and any required hydrant locations would require UCD Fire Department's approval.
- **Utility Water:** The campus' utility water system obtains water from six intermediate-depth aquifer wells to provide water for landscape irrigation, greenhouse irrigation, and some laboratories. The proposed point of connection is an existing 10-inch main along the existing driveway on the east side of the CORE 2 site.
- **Sanitary Sewer:** UC Davis operates a campus wastewater conveyance and treatment system that is independent from regional facilities. The campus Wastewater Treatment Plant (WWTP) is located in the south campus, and treated effluent from the plant discharges to Putah Creek. The peak month capacity of the campus WWTP, as regulated under the existing NPDES permit issued by the CVRWQCB, is 3.85 million gallons per day (mgd) average dry weather. UC Davis produces 1.6 mgd of wastewater. The proposed point of connection to serve the Project would be an existing manhole (SSMH3-45NW) along the existing driveway on the northeast side of the CORE 2 site.

- **Storm Drainage:** The central campus and developed parts of the west and south campuses are served by campus storm water drainage systems. The central campus drainage system involves a system of underground pipes that drain to the Arboretum Waterway, from which storm water is pumped to the South Fork of Putah Creek during large storm events. Storm water from the site would be directed via new drain lines and swales to a proposed detention basin at the southern edge of the CORE 2 site. Water in the detention basin would be discharged at a controlled flow rate into the Campus storm drain system. The proposed point of connection would be the existing storm manhole (SDMH2-52SW) in Hutchison Drive on the southwest side of the CORE 2 site. An alternative location for the detention basin is also being considered in this Initial Study and would be located in the northwest corner of the Future Expansion area. If such a site is pursued, it could result in a reduction in the number of greenhouses that could be sited in this area.
- **Electricity:** The main campus currently receives electricity from the Western Area Power Administration (WAPA) through PG&E transmission lines at the campus substation located south of I-80. The proposed point of connection would be at the existing manhole along the existing driveway on the east side of the CORE 2 site, which would connect to the Bowley Center 12KV building loop. The 12KV electrical services would be extended to the CORE 2 site.
- **Natural Gas:** The campus purchases natural gas from outside vendors and provides it to the campus facilities through PG&E pipelines. Natural gas is provided to four locations on the campus for use and distribution: the Central Heating and Cooling Plant, the Primate Center Plant, the Cogeneration Plant, and the Master Meter #1. The Project would use centralized hydronic heating for space heating in addition to heating from gas boilers. The proposed point of connection would be at an existing 3-inch gas main line also along the existing driveway.
- **Telecommunications:** The majority of all telephone, data, video, and wireless infrastructure and facilities on the campus are owned by the campus and operated by the UC Davis Communications Resources Department. The main campus switching facility is located in the Telecommunications Building. As new buildings are constructed, the Communications Resources Department coordinates with the UC Davis Office of Architects and Engineers to design and direct the installation of intra- and inter-building telecommunications facilities in accordance with established standards. The proposed point of connection would be the existing building distribution frame at the Bowley Plant Science Teaching Facility.
- **Fire Alarm:** The proposed buildings would be connected to the campus fire alarm system via a dedicated phone line.

6.17.2 2003 LRDP EIR Standards of Significance

The 2003 LRDP EIR considers a utilities and service systems impact significant if growth under the 2003 LRDP would:

- Exceed the Central Valley Regional Water Quality Control Board's wastewater treatment requirements.
- Require or result in the construction or expansion of water or wastewater treatment facilities, which would cause significant environmental effects.
- Require or result in the construction or expansion of storm water drainage facilities, which could cause significant environmental effects.
- Result in the need for new or expanded water supply entitlements.
- Exceed available wastewater treatment capacity.

- Be served by a landfill with insufficient permitted capacity to accommodate the Project’s solid waste disposal needs.
- Fail to comply with applicable federal, state, and local statutes and regulations related to solid waste.
- Require or result in the construction or expansion of electrical, natural gas, chilled water, or steam facilities, which would cause significant environmental impacts.
- Require or result in the construction or expansion of telecommunication facilities, which would cause significant environmental impacts.

6.17.3 2003 LRDP EIR Impacts and Mitigation Measures

Impacts of campus growth under the 2003 LRDP on utilities and service systems are evaluated in Section 4.15 of the 2003 LRDP EIR. As analyzed in Section 4 of this Initial Study, the Project is within the scope of analysis in the 2003 LRDP EIR. Significant and potentially significant utilities and service systems impacts identified in the 2003 LRDP EIR that are relevant to the Project are presented below with their corresponding levels of significance before and after application of mitigation measures identified in the 2003 LRDP EIR. In addition, LRDP Impacts 4.15-1, 4.15-2, 4.15-3, 4.15-6, 4.15-7 are considered less than significant prior to mitigation, but mitigation measures were identified in the 2003 LRDP EIR to further reduce the significance of these impacts.

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
UTILITIES & SERVICE SYSTEMS			
4.8-5	Campus growth under the 2003 LRDP would increase the amount of water extracted from the deep aquifer and would increase impervious surfaces. This could result in a net deficit in the deep aquifer volume or a lowering of the local groundwater table but would not interfere substantially with recharge of the deep aquifer.	S	SU
4.8-6	Campus growth under the 2003 LRDP could increase the amount of water extracted from the shallow/intermediate aquifer and would increase impervious surfaces. Extraction from the shallow/intermediate aquifer could deplete groundwater levels and could contribute to local subsidence, and increased impervious coverage could interfere substantially with recharge. This could result in a net deficit in the intermediate aquifer volume or a lowering of the local groundwater table.	S	SU
4.15-1	Implementation of the 2003 LRDP would require the expansion of campus domestic/fire water extraction and conveyance systems, which would not cause significant environmental impacts.	LS	LS
4.15-3	Implementation of the 2003 LRDP would require the expansion of wastewater treatment and conveyance facilities, the construction and operation of which would not result in significant environmental impacts.	LS	LS
4.15-5	Implementation of the 2003 LRDP would increase the volume of municipal solid waste that would require disposal, but would not require an expansion of the campus or county landfills.	LS	LS
4.15-10	Implementation of the 2003 LRDP together with other regional development could generate a cumulative demand for wastewater treatment facilities in the region, the construction of which could result in significant environmental impacts on habitat.	S	SU

2003 LRDP EIR Impacts		Level of Significance Prior to Mitigation	Level of Significance After Mitigation
UTILITIES & SERVICE SYSTEMS			
4.15-11	Implementation of the 2003 LRDP in conjunction with regional development could generate a cumulative demand for water, landfills, energy, and natural gas in the region, but the expansion of associated utilities and service systems to meet this demand would not result in significant environmental effects.	LS	LS

Levels of Significance: LS=Less than Significant, S=Significant, PS=Potentially Significant, SU=Significant and Unavoidable

Mitigation measures in the 2003 LRDP EIR that are applicable to the Project are presented below. Since these mitigation measures are already being carried out as part of implementation of the 2003 LRDP, they are considered part of the Project description and will not be readopted in this Initial Study or Negative Declaration. Nothing in this Initial Study in any way alters the obligations of the campus to implement 2003 LRDP EIR mitigation measures.

2003 LRDP EIR Mitigation Measures

UTILITIES & SERVICE SYSTEMS

- 4.4-1(a) During the project planning phase, the campus shall conduct a rare plant survey if the site is previously undeveloped and is in a valley-foothill riparian, open water pond, riverine, wetland or ruderal/annual grassland or habitat. Surveys shall be conducted by qualified biologists in accordance with the most current CDFG/USFWS guidelines or protocols and shall be conducted during the blooming period of the plant species with potential to occur in the area, as listed in Table 4.4-2. If these surveys reveal no occurrences of any species, then no further mitigation would be required.
- 4.4-1(b) Should surveys determine that special-status plant species are present, measures will be taken to avoid the plants and the associated habitat necessary for long-term maintenance of the population. If avoidance is not feasible the campus will provide off-site compensation at a 1:1 ratio. Off-site compensation will include preservation of existing populations at other sites and/or enhancement of the affected species. The campus will preserve either an equal number of the affected plants or an equal area of the affected species habitat. The campus shall also develop and fund the implementation of a plan to manage and monitor the preserve to ensure the long-term survival of the preserved population.
- 4.5-1(a) As early as possible in the project planning process, the campus shall define the project's area of potential effects (APE) for archaeological resources and, if structures are present on the site, for historic structures. The campus shall determine the potential for the project to result in cultural resource impacts, based on the extent of ground disturbance and site modification anticipated for the proposed project. Based on this information, the campus shall:
- (i) Prepare an inventory of all buildings and structures within the APE that will be 50 years of age or older at the time of project construction for review by a qualified architectural historian. If no structures are present on the site, there would be no impact to historic built environment resources from the project. If potentially historic structures are present, LRDP Mitigation 4.5-1(c) shall be implemented.
 - (ii) Determine the level of archaeological investigation that is appropriate for the project site and activity, as follows:
 - Minimum: excavation less than 18 inches deep and in a relatively small area (e.g., a trench for lawn irrigation, tree planting, etc.). Implement LRDP Mitigation 4.5-1(b)(i).
 - Moderate: excavation below 18 inches deep and/or over a large area on any site that has not been characterized and is not suspected to be a likely location for archaeological resources. Implement LRDP Mitigation 4.5-1 (b)(i) and (ii).
 - Intensive: excavation below 18 inches and/or over a large area on any site that is within 800 feet of the historic alignment of Putah Creek, or that is adjacent to a recorded archaeological site. Implement LRDP Mitigation 4.5-1 (i), (ii) and (iii).

UTILITIES & SERVICE SYSTEMS

- 4.5-1(b) During the planning phase of the project, the campus shall implement the following steps to identify and protect archaeological resources that may be present in the APE:
- (i) For project sites at all levels of investigation, contractor crews shall be required to attend an informal training session prior to the start of earth moving, regarding how to recognize archaeological sites and artifacts. In addition, campus employees whose work routinely involves disturbing the soil shall be informed how to recognize evidence of potential archaeological sites and artifacts. Prior to disturbing the soil, contractors shall be notified that they are required to watch for potential archaeological sites and artifacts and to notify the campus if any are found. In the event of a find, the campus shall implement item (vi), below.
 - (ii) For project sites requiring a moderate or intensive level of investigation, a surface survey shall be conducted by a qualified archaeologist during project planning and design and prior to soil disturbing activities. For sites requiring moderate investigation, in the event of a surface find, intensive investigation will be implemented, as per item (iii), below. Irrespective of findings, the qualified archaeologist shall, in consultation with the campus, develop an archaeological monitoring plan to be implemented during the construction phase of the project. The frequency and duration of monitoring shall be adjusted in accordance with survey results, the nature of construction activities, and results during the monitoring period. In the event of a discovery, the campus shall implement item (vi), below.
 - (iii) For project sites requiring intensive investigation, irrespective of subsurface finds, the campus shall retain a qualified archaeologist to conduct a subsurface investigation of the project site, to ascertain whether buried archaeological materials are present and, if so, the extent of the deposit relative to the project's area of potential effects. If an archaeological deposit is discovered, the archaeologist will prepare a site record and file it with the California Historical Resource Information System.
 - (iv) If it is determined through step (iii), above, that the resource extends into the project's area of potential effects, the resource will be evaluated by a qualified archaeologist, who will determine whether it qualifies as a historical resource or a unique archaeological resource under the criteria of CEQA Guidelines § 15064.5. If the resource does not qualify, or if no resource is present within the project area of potential effects (APE), this will be noted in the environmental document and no further mitigation is required unless there is a discovery during construction (see (vi), below).
 - (v) If a resource within the project APE is determined to qualify as an historical resource or a unique archaeological resource (as defined by CEQA), the campus shall consult with the qualified archaeologist to consider means of avoiding or reducing ground disturbance within the site boundaries, including minor modifications of building footprint, landscape modification, the placement of protective fill, the establishment of a preservation easement, or other means that will permit avoidance or substantial preservation in place of the resource. If avoidance or substantial preservation in place is not possible, the campus shall implement LRDP Mitigation 4.5-2(a).
 - (vi) If a resource is discovered during construction (whether or not an archaeologist is present), all soil disturbing work within 100 feet of the find shall cease. The campus shall contact a qualified archaeologist to provide and implement a plan for survey, subsurface 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. LRDP Mitigation 4.5-1(b), steps (iii) through (vii) shall be implemented.
 - (vii) A written report of the results of investigations will be prepared by a qualified archaeologist and filed with the appropriate Information Center of the California Historical Resources Information System.
- 4.8-5(a) The campus shall continue to implement water conservation strategies to reduce demand for water from the deep aquifer. Domestic water conservation strategies shall include the following or equivalent measures:
- (i) Install water efficient shower heads and low-flow toilets that meet or exceed building code conservation requirements in all new campus buildings, and where feasible, retrofit existing buildings with these water efficient devices.
 - (ii) Continue the leak detection and repair program.
 - (iii) Continue converting existing single-pass cooling systems to cooling tower systems.
 - (iv) Use water-conservative landscaping on the west and south campuses where domestic water is used for irrigation.

2003 LRDP EIR Mitigation Measures

UTILITIES & SERVICE SYSTEMS

- (v) Replace domestic water irrigation systems on the west and south campuses with an alternate water source (shallow/intermediate or reclaimed water), where feasible.
- (vi) Install water meters at the proposed neighborhood to encourage residential water conservation.
- (vii) Identify and implement additional feasible water conservation strategies and programs including a water awareness program focused on water conservation.
- 4.15-1(a) Once preliminary project design is developed, the campus shall review each project to determine if existing domestic/fire water supply is adequate at the point of connection. If domestic/fire water is determined inadequate, the campus will upgrade the system to provide adequate water flow and pressure to the project site before constructing the project.
- 4.15-1(b) Implement domestic water conservation strategies as indicated in LRDP Mitigation 4.8-5(a) (see Section 7.8 Hydrology and Water Quality of this Tiered Initial Study).
- 4.15-3 Once preliminary project design is developed, the campus shall review each project to determine whether existing capacity of the sanitary sewer line at the point of connection is adequate. If the capacity of the sewer line is determined inadequate, the campus will upgrade the system to provide adequate service to the project site prior to occupation or operation.

6.17.4 Environmental Checklist and Discussion

UTILITIES & SERVICE SYSTEMS

Would the project...	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the providers existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Comply with federal, state, and local statutes and	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

UTILITIES & SERVICE SYSTEMS					
Would the project...	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
regulations related to solid waste?					
h) Require or result in the construction or expansion of electrical, natural gas, chilled water, or steam facilities, which would cause significant environmental impacts?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i) Require or result in the construction or expansion of telecommunication facilities, which would cause significant environmental impacts?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a) The Project would involve the demolition of existing greenhouses and support structures on the Orchard Park Greenhouses site and the construction of greenhouses and associated features on the CORE 2 Project site. A minimal amount of wastewater would be produced by the Project. Sewer flows resulting from construction of the Project are not expected to exceed a building demand load of 5,400 gpd (0.005 mgd) at campus peak (UC Davis 2016a). The permitted peak monthly average capacity of the campus WWTP is currently 3.85 mgd, which can accommodate the projected growth under the 2003 LRDP, including the proposed Project. The current average flows are approximately 1.6 mgd. As discussed further in item “a, f” in Section 7.9, Hydrology and Water Quality, with continuation of current practices and implementation of 2003 LRDP EIR mitigation measures, the campus anticipates meeting the WWTP’s permit requirements. All flows from the Project site would be treated at the WWTP in accordance with the NPDES permit requirements and Waste Discharge Requirements; therefore, the impact associated with possible exceedances of WWTP requirements would be less than significant.

The 2003 LRDP EIR found that campus development under the 2003 LRDP, in conjunction with regional growth, would significantly increase demand for wastewater treatment facilities in the region (LRDP Impact 4.15-10). However, the Project would not increase the regional population. Therefore, the Project would not contribute to the cumulative impact identified in the 2003 LRDP EIR.

b) Domestic Water Facilities

The Project would require the use of domestic/fire water on the CORE 2 Project site and would connect to the campus system through an existing 8-inch main on the east side of the CORE 2 site. Existing utilities on the Orchard Park Greenhouses site would be removed with the Project. As the amount of domestic water supply used for existing greenhouses and support structures on the Orchard Park Greenhouses site would be similar to the amount that would be used by greenhouses and associated structures proposed by the Project, minimal change in overall domestic water use would occur.

The 2003 LRDP EIR identified that campus development under the 2003 LRDP would require the expansion of campus domestic/fire water extraction and conveyance systems, the construction of which would not cause significant environmental impacts (LRDP Impact 4.15-1). Therefore, effects associated with domestic water utility extensions would be less than significant. LRDP Mitigation 4.15-1(a-b), included in the proposed Project, would further reduce the significance of this impact by requiring the water conservation strategies outlined in LRDP Mitigation 4.8-5(a) (see Hydrology and Water Quality section) and by requiring the campus to review the Project to determine if the domestic/fire water supply is adequate at the point of connection and if any upgrades to the system are required.

Impact 4.15-11 of the 2003 LRDP EIR found that campus development under the 2003 LRDP, in conjunction with regional growth would significantly increase demand for domestic water in the region. Therefore, it is likely that under the 2003 LRDP, the domestic water distribution systems of surrounding jurisdictions would need to be expanded to serve growth. The LRDP-related population that resides in these communities could contribute to the need for these improvements. However, environmental impacts from distribution system improvements are expected to be less than significant because these improvements would likely include minor disturbances and would likely be located within existing roads or other already disturbed environments. The cumulative impact on regional aquifers from increased withdrawal of groundwater to serve the increased population is discussed in Section 4.8 Hydrology and Water Quality of the 2003 LRDP EIR. The Project is within the scope of growth evaluated in the 2003 LRDP and would not increase campus population or regional population beyond levels already anticipated under the LRDP. Therefore, the proposed project would not contribute to the cumulative impact identified in the 2003 LRDP EIR.

Utility Water Facilities

The Project would connect to the existing utility water system for greenhouse and landscape irrigation. The proposed point of connection for utility water is an existing 10-inch main along the existing driveway on the east side of the CORE 2 site. The existing connection is adequate to serve the maximum possible demand for daily consumption. Existing utilities on the Orchard Park Greenhouses site would be removed with the Project; therefore, no utility water demand would exist on this site. This impact would be less than significant.

Wastewater Facilities

The CORE 2 Project site would connect to an existing manhole (SSMH3-45NW) along the existing driveway on the northeast side of the CORE 2 site. Existing utilities on the Orchard Park Greenhouses site would be removed with the Project and no wastewater would be generated on the site. The operating capacity of the WWTP is 3.85 mgd, and current average flows are approximately 1.6 mgd. The 2003 LRDP EIR identified that implementation of the 2003 LRDP, would require the expansion of campus wastewater treatment and conveyance facilities, the construction and operation of which would not result in significant environmental impacts (LRDP Impact 4.15-3). Future expansion of the existing WWTP and installation of new sanitary sewer conveyance lines would primarily occur on previously disturbed ground. In addition, the campus would survey the site before construction and perform monitoring during construction (in compliance with 2003 LRDP Mitigations 4.4-1 and 4.5-1) to avoid inadvertent biological and cultural resource impacts. Therefore, this impact would be less than significant. LRDP Mitigation 4.15-3, included in the proposed Project, would further reduce the significance of this impact by ensuring that the campus review projects to determine if there is adequate capacity to provide sanitary sewer service, and to upgrade the system as necessary.

Impact 4.15-10 of the 2003 LRDP EIR found that campus development under the 2003 LRDP, in conjunction with regional growth, would significantly increase demand for wastewater treatment facilities in the region. However, there is no evidence indicating that LRDP-related population in Davis, Woodland, Winters, and Dixon will contribute to the need for new or expanded utility systems that will have a significant effect on the environment. To the extent that LRDP-related population growth contributes to the need for expanded wastewater treatment facilities and infrastructure that result in loss of farmland, in compliance with LRDP Mitigation 4.15-10, the campus would negotiate with affected jurisdictions to determine the University's fair share of costs for feasible mitigation to reduce associated significant environmental impacts. The campus' contribution to mitigation could include implementation of preservation mechanisms for on-campus prime farmland and/or habitat conservation. However, impacts associated with an irreversible loss of farmland and habitat could not be reduced to less-than-significant levels. Therefore, this impact is considered significant and unavoidable. This impact was

adequately analyzed in the 2003 LRDP EIR and fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. As discussed previously, the Project would not increase student population or induce substantial population growth in the project area, and therefore not result in a cumulatively considerable impact to wastewater treatment facilities and infrastructure. Because the Project is within the scope of development under the 2003 LRDP and existing conditions have not changed substantially since preparation of the 2003 LRDP EIR, the Project would not alter this previous analysis or conclusion.

c) The Project would construct a storm water detention basin at the southern end of the CORE 2 Project site. Storm water from the CORE 2 Project site would be directed through new drain lines and swales on the project site to the proposed detention basin. Water in the detention basin would be discharged at a controlled flow rate into the Campus storm drain system. The proposed point of connection would be the existing storm manhole (SDMH2-52SW) in Hutchison Drive on the southwest side of the CORE 2 site. Therefore, the Project would have no impact on the need to expand or construct stormwater facilities.

d) The Project would increase the amount of water used for domestic purposes from the deep aquifer. Impacts associated with the Project's demand for water from the deep and shallow/intermediate aquifers are addressed in item (b) in Section 7.9, Hydrology and Water Quality. As addressed, mitigation measures would be implemented under the 2003 LRDP to reduce the campus' demand for domestic/fire and utility water, to monitor impacts on the groundwater aquifers, and to manage water sources if impacts on the aquifers are identified. However, regardless of mitigation, because the effects of increased groundwater extraction are not currently well understood, impacts of increased water use are considered significant and unavoidable (LRDP Impacts 4.8-5 and 4.8-6). These impacts were adequately analyzed in the 2003 LRDP EIR and fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents in connection with its approval of the 2003 LRDP. No conditions have changed and no new information has become available since certification of the 2003 LRDP EIR that would alter this previous analysis.

The 2003 LRDP EIR found that campus development under the 2003 LRDP, in conjunction with regional growth would significantly increase demand for domestic water in the region (LRDP Impact 4.15-11). However, the Project would not increase campus population, regional population or the amount of water required at the Project site. Therefore, the Project would not contribute to the cumulative impact identified in the 2003 LRDP EIR.

e) The campus' WWTP would provide wastewater treatment for the Project site. As discussed in item (b) above, the Project would not increase the wastewater flows on the Project site. LRDP Mitigation 4.15-3, included in the proposed Project, would ensure the implementation of the campus practice of reviewing projects to determine if there is adequate capacity to provide sanitary sewer service, and to upgrade the system as necessary. The proposed Project was evaluated and determined to not require an upgrade to the campus WWTP. Therefore, this impact would be less than significant.

f) The waste disposal needs of the Project would be served by the Yolo County Landfill, located northeast of the City. Solid waste from the Project site would be recycled the extent feasible, then collected by UC Davis and transported to the Yolo County Landfill. Per the UC Policy on Sustainable Practices, the University's goal for diverting municipal solid waste from landfills is 75% as of June 30, 2012 with an ultimate goal of zero waste by 2020. Diversion includes recycling and composting of food scraps or wood and paper products.

The Yolo County Landfill has a permitted capacity of 1,800 tons per day and is anticipated to have adequate capacity for continued operation through the year 2081 (CalRecycle 2016). Therefore, the

Yolo County Landfill would have adequate capacity to serve the Project and the impact would be less than significant.

The 2003 LRDP EIR found that campus development under the 2003 LRDP, in conjunction with regional growth would significantly increase demand on the regional landfill (LRDP Impact 4.15-11). However, the Project would not increase demand for the Yolo County Landfill beyond what was analyzed in the 2003 LRDP EIR. The cumulative impact is adequately analyzed in the 2003 LRDP EIR and no further evaluation is required.

As discussed in LRDP EIR Impact 4.15-5, there is adequate capacity at the Yolo County landfill, and an expansion of the County landfill would not be required through the 2003 LRDP's planning horizon. Therefore, there would not be any environmental effects associated with landfill expansion from the growth associated with the off-campus population. Furthermore, the Project would be incorporated into the campus waste and recycling program, consistent with UC Policy on Sustainable Practices. Therefore, the proposed project would not increase demand for the Yolo County Landfill beyond what was analyzed in the 2003 LRDP EIR. The Project is within the scope of development under the 2030 LRDP and would not alter the previous analysis or conclusions.

g) Materials generated during demolition of the existing greenhouses and support structures on the Orchard Park Greenhouses site would be separated into different categories for reuse, recycling or landfill disposal. As the buildings are demolished, some materials such as copper from pipes and wiring and other metals would be gathered for recycling. The UC Policy on Sustainable Practices includes objectives for diversion of solid waste. The Project would comply with all applicable statutes and regulations related to solid waste. Therefore, the impact would be less than significant.

h) The proposed Project would, at buildout, reduce the demand for electricity and natural gas as new, more efficient, greenhouses are constructed, and the older greenhouses are demolished. The Project is designed to comply with the UC Policy on Sustainable Practices. The existing utilities have adequate capacity to serve the Project and no off-site improvements or other increases to utility capacity would be required by the Project. The impact would be less than significant.

The 2003 LRDP EIR found that campus development under the 2003 LRDP, in conjunction with regional growth, would significantly increase demand for electricity and natural gas (LRDP Impact 4.15-11). However, the Project would not increase demand for the electricity and natural gas beyond what was analyzed in the 2003 LRDP EIR. Therefore, the cumulative impact is adequately analyzed in the 2003 LRDP EIR and no further evaluation is required.

The 2003 LRDP EIR found that campus development under the 2003 LRDP, in conjunction with regional growth, would significantly increase demand for electricity and natural gas (LRDP Impact 4.15-11). However, the Project would not increase demand for the electricity and natural gas beyond what was analyzed in the 2003 LRDP EIR. Therefore, the cumulative impact is adequately analyzed in the 2003 LRDP EIR and no further evaluation is required. Impact 4.15-11 of the 2003 LRDP EIR found that campus development under the 2003 LRDP, in conjunction with regional growth, would significantly increase demand for electricity and natural gas. The campus and other communities in the region would depend upon the regional suppliers of natural gas and electricity. While the demand for electricity and natural gas at full development of the campus under the 2003 LRDP would not by itself be sufficient to trigger the need for new electric or gas generation facilities, this demand, when combined with demand due to other regional growth, would require that new generation facilities be established. It is not possible to reasonably predict where the new generation facilities would be located, or to evaluate environmental impacts from the construction and operation of these new facilities. However, should they be proposed in California, the California Energy Commission conducts a complete environmental review of proposed

power plant projects 50 megawatts and larger before approving them, and requires as a matter of practice that all significant impacts be mitigated to a less-than-significant level. Smaller projects must also go through environmental review under the oversight of the local jurisdiction in which they are proposed. Accordingly, this cumulative impact is considered to be less than significant. The proposed project would not increase demand for the electricity and natural gas beyond what was analyzed in the 2003 LRDP EIR. The Project is within the scope of development under the 2030 LRDP, existing conditions have not changed substantially since preparation of the 2003 LRDP EIR and would not alter the previous analysis or conclusions.

i) The Project would connect to the campus telecommunications system at the existing building distribution frame at the Bowley Plant Science Teaching Facility. As new buildings are constructed, the Communications Resources Department coordinates with the UC Davis Office of Architects and Engineers to design and direct the installation of intra- and inter-building telecommunications facilities in accordance with established standards. No additional capacity would be needed to serve the Project and no off-site construction would be required. The impact would be less than significant.

6.18 MANDATORY FINDINGS OF SIGNIFICANCE

MANDATORY FINDINGS OF SIGNIFICANCE	Potentially Significant Impact	Less than Significant with Project-level Mitigation	Impact adequately addressed in 2003 LRDP EIR	Less than Significant Impact	No Impact
Would the project...					
a) Does the project have the potential to 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, 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project 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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

a) The Project would not significantly affect fish or wildlife habitat, nor would it eliminate examples of California history or prehistory. Cumulative regional impacts to these resources could be significant, but the Project would not contribute to those impacts.

b,c) Cumulative impacts related to the implementation of the 2003 LRDP and other regional growth are discussed in each environmental section, above. These impacts were adequately analyzed in the 2003 LRDP EIR and fully addressed in the Findings and Statement of Overriding Considerations adopted by The Regents

in connection with its approval of the 2003 LRDP. No conditions have changed and no new information has become available since certification of the 2003 LRDP EIR that would alter this previous analysis.

The Project would not have environmental effects that are substantial adverse effects, direct or indirect, on human beings.

7 DEPARTMENT OF FISH & WILDLIFE DETERMINATION

CDFW imposes and collects a filing fee to defray the costs of managing and protecting California's vast fish and wildlife resources, including, but not limited to, consulting with other public agencies, reviewing environmental documents, recommending mitigation measures, and developing monitoring programs.. The CEQA filing fee will be waived if a project will have no effect on fish and wildlife (Fish & G. Code, § 711.4, subd. (c)(2)(A)). Additionally, projects that are statutorily or categorically exempt from CEQA are also not subject to the filing fee and do not require a no effect determination (Cal. Code Regs., tit. 14, §§ 15260-15333; Fish & G. Code, § 711.4, subd. (d)(1)). Only CDFW staff is responsible for determining whether a project will qualify for a No Effect Determination and if the CEQA filing fee will be waived.

Certificate of Fee Exemption

Pay Fee

INTENTIONALLY LEFT BLANK

8 REFERENCES

- 75 FR 25324–25728. Final rule: “Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards.” May 7, 2010.
- 77 FR 62624–63200. Final rule: “2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards.” October 15, 2012.
- ACC Environmental Consultants, Inc. 2016. Comprehensive Hazardous Materials Survey for the Planned Demolition Project University of California at Davis – Tercero Dining Commons 2(Temporary Buildings TB 161-205 and Trailer D), One Shields, Davis California. April 13, 2016.
- Brown and Caldwell 2013. *Integrated Water Resources Study*. Prepared for the City of Davis. August 2013.
- California Air Pollution Control Officers Association (CAPCOA). 2008. CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act.
- California Air Resources Board (CARB). 2008. *Climate Change Scoping Plan: A Framework for Change*. December 12, 2008. Accessed February 24, 2014. <http://www.arb.ca.gov/cc/scopingplan/document/psp.pdf>.
- CARB. 2014. *First Update to the Climate Change Scoping Plan: Building on the Framework Pursuant to AB 32 – The California Global Warming Solutions Act of 2006*. May 2014. http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf.
- CARB. 2016. “Air Quality Standards and Area Designations.” Area Designations Maps/State and National. Page last reviewed May 5, 2016. <http://www.arb.ca.gov/desig/desig.htm>
- CARB. 2017a. “California Greenhouse Gas Inventory – 2017 Edition.” Last reviewed June 6, 2017. Available at: <http://www.arb.ca.gov/cc/inventory/data/data.htm>
- CARB. 2017b. *The 2017 Climate Change Scoping Plan Update*. January 20, 2017. Accessed August 2017. https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf.
- California Climate Action Team (CAT). 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. Sacramento, California: California Environmental Protection Agency, California Climate Action Team. March 2006. http://www.climatechange.ca.gov/climate_action_team/reports/2006report/2006-04-03_FINAL_CAT_REPORT.PDF.
- CAT. 2017. “Climate Action Team Reports.” Available at: http://climatechange.ca.gov/climate_action_team/reports/index.html.
- California Department of Conservation (CDC), Division of Mines and Geology (currently California Geological Survey). 2008. Probabilistic Seismic Hazard Assessment for the State of California. Ground Motion Interpool. http://www.quake.ca.gov/gmaps/PSHA/psha_interpolator.html.

- California Department of Conservation (CDC). 2015. Farmland Mapping and Monitoring Program “Yolo County Important Farmland 2014.” September 2015. <ftp://ftp.consrv.ca.gov/pub/dllrp/FMMP/pdf/2014/yol14.pdf>
- California Department of Resources Recycling and Recovery. 2016. Yolo County Central Landfill (57-AA-0001). <http://www.calrecycle.ca.gov/SWFacilities/Directory/57-AA-0001/Detail/>
- California Department of Transportation (Caltrans). 2016. “State Scenic Highways Mapping Program: Yolo County.” Accessed August 16, 2016. http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/
- California Energy Commission (CEC). 2015. “2016 Building Efficiency Standards Adoption Hearing.” Accessed August 2017. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2015-06-10_hearing/2015-06-10_Adoption_Hearing_Presentation.pdf.
- California Environmental Protection Agency (Cal EPA), Climate Action Team. 2006. Climate Action Team Report to Governor Schwarzenegger and the Legislature.
- Education Data Partnership (Ed-Data). 2014. District Profile Fiscal Year: 2013-2014, Davis Joint Unified School District. <http://www.ed-data.k12.ca.us/Pages/Home.aspx>. Last updated March 3, 2014.
- Energy Information Administration. 2007. —Other Gases: Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride, http://www.eia.doe.gov/oiaf/1605/ggrpt/summary/other_gases.html.
- Intergovernmental Panel on Climate Change (IPCC). 1996. Climate Change 1995: The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change.
- Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: The Physical Science Basis, Summary for Policymakers. http://ipcc-wg1.ucar.edu/wg1/docs/WG1AR4_SPM_PlenaryApproved.pdf.
- Nelson, Jacob and Bruce Bugbee. 2014. “Utah State University Crop Physiology Laboratory: 5-Year Cost Calculator for Plant Lighting, Version 1.0.2”. Available at: <http://cpl.usu.edu/htm/publications/file=15575>
- Pacific Legacy. 2017. Letter report to Matt Dulich “Archaeological Monitoring for the Core 2 Greenhouses at Eleven Locations.” August 31, 2017
- Sacramento Metropolitan Air Quality Management District (SMAQMD). 2009. Guide to Air Quality Assessment in Sacramento County.
- State of California, Governor’s Office of Planning and Research (OPR). 2008. CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review.
- State of California, Governor’s Office of Planning and Research (OPR). 2009. Draft CEQA Guideline Amendments for Greenhouse Gas Emissions.
- Trauernicht, Nathan. 2010. Personal communication (email) with Matt Dulcich. Chief Nathan Trauernicht, UC Davis Fire Department regarding staffing levels. June 17, 2010.

- University of California Regents (UC Regents). 2016. UC Sustainable Practices Policy. September. Available at: <http://policy.ucop.edu/doc/3100155/Sustainable%20Practices>
- University of California Regents. 2016. "Police Department Annual Report and Crime Statistics – 2015 UC Davis." Accessed September 13, 2016. Available at <http://police-statistics.universityofcalifornia.edu/2015/ucd.html>
- University of California Davis (UC Davis). 1997. UC Davis Water Management Plan. Adopted October 1997.
- UC Davis. 2003. UC Davis Long Range Development Plan Final Environmental Impact Report. Certified October 2003.
- UC Davis. 2010. 2009–2010 Climate Action Plan. June 1, 2010. Available at: http://sustainability.ucdavis.edu/local_resources/docs/climate_action_plan.pdf
- UC Davis. 2011a. *UC Davis Bicycle Plan*. 2011.
- UC Davis. 2014. Tercero Student Housing Phase 4 Project Tiered Initial Study/Mitigated Negative Declaration. State Clearinghouse No. 2013122054. August 2014.
- UC Davis. 2015a. Campus Data. <http://budget.ucdavis.edu/data-reports/>. April 24, 2015.
- UC Davis. 2015b. *Results of the 2014-2015 Travel Survey*. September 2015. Available at <http://its.ucdavis.edu/campus-travel-surveys/>
- UC Davis. 2016a. Tercero Dining Commons 2 Site Utility Study. August 2016.
- UC Davis. 2016b. UC Davis Total On- and Off-Campus Headcount Population Annual Averages. August 15, 2016.
- UC Davis. 2017. Personal communication via email between Brian Grattidge with Dudek and Matt Dulcich and Joshua Morejohn with UC Davis in regards to energy use at existing greenhouses on campus. July 2017.
- UC Davis Fire Department. 2016. "UC Davis Fire Department – Our Team." Accessed September 13, 2016. Available at <http://fire.ucdavis.edu/about/our-team/index.html>
- UC Davis ORMP. 2003a. Fall 2002 UC Davis Travel Behavior Survey.
- University of California Office of the President (UCOP). 2013. *President's Initiative: The First Research University to Achieve Carbon Neutrality*. Available at: http://ucop.edu/sustainability/_files/carbon-neutrality2025.pdf
- University of Massachusetts Extension. 2009. "Sizing the Greenhouse Water System". Greenhouse Crops and Floriculture Program. Available at: <https://ag.umass.edu/greenhouse-floriculture/fact-sheets/sizing-greenhouse-water-system>
- U.S. Bureau of Reclamation (USBR). 1998. Monticello Dam Breach Simulation Maximum Inundation and Leading Edge Times (map).

- U.S. Bureau of Reclamation (USBR). 2000. Comprehensive Facility Review, Monticello Dam, Solano Project, California.
- U.S. Census Bureau, “Data Finders,” <http://www.census.gov/>. 2009; California Department of Finance, “E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2008, with 2000 Benchmark,” <http://www.dof.ca.gov/research/demographic/reports/estimates/e-5/2009/>. 2010.
- U.S. Environmental Protection Agency (EPA). 2017a. “Region 9: Air Programs, Air Quality Maps.” Last updated March 2017. <http://www3.epa.gov/region9/air/maps/index.html#cal>.
- U.S. Environmental Protection Agency (EPA). 2017b. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015*. EPA 430-P-17-001. Washington, D.C.: EPA. April 15, 2017. Available at: https://www.epa.gov/sites/production/files/2017-02/documents/2017_complete_report.pdf.
- EPA and National Highway Traffic Safety Administration (EPA and NHTSA). 2016. Medium- and Heavy-Duty Fuel Efficiency Standards. August 16, 2016. Available at: <https://www.epa.gov/newsreleases/epa-and-dot-finalize-greenhouse-gas-and-fuel-efficiency-standards-heavy-duty-trucks-0>.
- Yolo-Solano Air Quality Management District (YSAQMD). 2007. *Handbook for Assessing and Mitigating Air Quality Impacts*. July 2007.
- YSAQMD. 2016. *Draft Triennial Assessment and Plan Update*. March 2016.
- YSAQMD, Sacramento Metropolitan Air Quality Management District, El Dorado County Air Quality Management District, Feather River Air Quality Management District, and Placer County Air Pollution Control District. 2013. *Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan (2013 SIP Revisions)*. September 2013.

9 REPORT PREPARERS

9.1 UC DAVIS

Matt Dulcich, AICP, Director of Environmental Planning, UC Davis Campus Planning and Environmental Stewardship

9.2 DUDEK

Ann Sansevero, AICP, Principal-in-Charge/Project Manager

Brian Grattidge, Project Coordinator

Lisa Achter, Project Biologist

Chris Barnobi, INCE, Noise Analyst

Matthew Morales, Air Quality and GHG Analyst

Shilpa Iyer, Planning Technician

Rachel Strobridge, GIS and Graphics

INTENTIONALLY LEFT BLANK

APPENDIX A
PROPOSED NEGATIVE DECLARATION

PROPOSED NEGATIVE DECLARATION

- Lead Agency:** University of California
- Project Proponent:** University of California, Davis
- Project Location:** The Project is located north of the Residence Hall Area, at the northwest corner of Tercero Hall Circle and Bioletti Way.
- Project Description:** UC Davis proposes to construct additional greenhouses in phases at the CORE 2 site. As new greenhouses are constructed, the existing greenhouses at Orchard Park would gradually be removed. The project phasing is expected to occur over a ten-year period. The Orchard Park Greenhouses site would eventually be redeveloped in a manner consistent with the LRDP. However, future redevelopment of the Orchard Park Greenhouses site is currently not proposed or scheduled. At such time as the site is considered for development an appropriate CEQA review would be conducted to evaluate the environmental effects of such a future project.
- The CORE 2 Greenhouse Expansion at the CORE 2 site includes three components:
- The Cacao Germplasm Greenhouses;
 - Phase 1 Greenhouses Expansion; and
 - Future Expansion Area.
- The CORE 2 site would include support buildings (headhouses), utilities, limited parking, access roads, a soil area, and a detention pond.
- Mitigation Measure:** No project-specific mitigation measures are proposed.
- Reference:** This Proposed Negative Declaration incorporates by reference in their entirety the text of the Tiered Initial Study prepared for the Project, the 2003 LRDP, and the 2003 LRDP EIR.
- Determination:** In accordance with CEQA, a Draft Tiered Initial Study has been prepared by UC Davis that evaluates the environmental effects of the Project. On the basis of the Project's Draft Tiered Initial Study, the campus found that the Project could not have a significant effect on the environment that has not been previously addressed in the 2003 LRDP EIR, and no new mitigation measures, other than those previously identified in the 2003 LRDP EIR, are required.
- Public Review:** In accordance with Section 15073 of the CEQA Guidelines, the Draft Tiered Initial Study for the Project will be circulated for public and agency review from November 2 to December 2, 2016. Comments received during the review period and responses to these comments will be presented in the final Tiered Initial Study.

INTENTIONALLY LEFT BLANK

APPENDIX B
AIR QUALITY AND GREENHOUSE GAS CALCULATIONS

UCD CORE 2 Greenhouse Construction - Yolo County, Annual

**UCD CORE 2 Greenhouse Construction
Yolo County, Annual**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	5.00	Employee	0.85	6,680.00	0
Parking Lot	0.05	Acre	0.05	2,178.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	6.8	Precipitation Freq (Days)	54
Climate Zone	2			Operational Year	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	499.66	CH4 Intensity (lb/MWhr)	0.023	N2O Intensity (lb/MWhr)	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Modeling construction only

Land Use - Site: 0.85 acres of greenhouses and 0.05 acres paved per year assumed

Construction Phase - Adjusted construction schedule to 7 month duration, followed by 3 weeks of demolition

Off-road Equipment - Default equipment assumed

On-road Fugitive Dust - Based on site location, changed % pave workers to 100%. % pave vendor and hauling changed to 99%, to account for any travel on unpaved areas on-site

Demolition - Demolition - 5,325 SF assumed after each 7 month construction period

Grading - 10 total acres graded (default)

Architectural Coating - Reduced architectural coating surfaces by 75%, since the majority of development would be greenhouses and would not require coatings

Vehicle Trips - Modeling construction only

Energy Use - Modeling energy outside of CalEEMod

Construction Off-road Equipment Mitigation - Water exposed area 2x per day

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	3,340.00	835.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	10,020.00	2,505.00
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblEnergyUse	NT24E	0.34	0.00
tblEnergyUse	T24E	3.94	0.00
tblGrading	AcresOfGrading	0.00	10.00
tblLandUse	BuildingSpaceSquareFeet	3,528.91	6,680.00
tblLandUse	LandUseSquareFeet	3,528.91	6,680.00
tblLandUse	LotAcreage	0.08	0.85
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.023

tblProjectCharacteristics	CO2IntensityFactor	641.35	499.66
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2018	2020
tblSolidWaste	SolidWasteGenerationRate	4.00	0.00
tblVehicleTrips	ST_TR	3.12	0.00
tblVehicleTrips	WD_TR	8.96	0.00
tblWater	IndoorWaterUseRate	41,109.12	0.00
tblWater	OutdoorWaterUseRate	64,298.88	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.1021	0.8851	0.6344	1.0200e-003	0.0330	0.0542	0.0873	7.6700e-003	0.0504	0.0580	0.0000	92.1577	92.1577	0.0244	0.0000	92.7679
Maximum	0.1021	0.8851	0.6344	1.0200e-003	0.0330	0.0542	0.0873	7.6700e-003	0.0504	0.0580	0.0000	92.1577	92.1577	0.0244	0.0000	92.7679

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.1021	0.8851	0.6344	1.0200e-003	0.0214	0.0542	0.0756	4.5100e-003	0.0504	0.0549	0.0000	92.1576	92.1576	0.0244	0.0000	92.7677
Maximum	0.1021	0.8851	0.6344	1.0200e-003	0.0214	0.0542	0.0756	4.5100e-003	0.0504	0.0549	0.0000	92.1576	92.1576	0.0244	0.0000	92.7677

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	35.32	0.00	13.36	41.20	0.00	5.45	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2018	3-31-2018	0.3619	0.3619
2	4-1-2018	6-30-2018	0.3990	0.3990
3	7-1-2018	9-30-2018	0.2202	0.2202
		Highest	0.3990	0.3990

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2018	1/26/2018	5	20	
2	Grading	Grading	1/27/2018	2/23/2018	5	20	
3	Building Construction	Building Construction	2/24/2018	7/13/2018	5	100	
4	Paving	Paving	7/1/2018	7/16/2018	5	11	
5	Architectural Coating	Architectural Coating	7/17/2018	7/31/2018	5	11	
6	Demolition	Demolition	8/1/2018	8/21/2018	5	15	

Acres of Grading (Site Preparation Phase): 10

Acres of Grading (Grading Phase): 10

Acres of Paving: 0.05

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 2,505; Non-Residential Outdoor: 835; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42

Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class	
Demolition		4	10.00	0.00	24.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation		2	5.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading		4	10.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction		5	4.00	1.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving		7	18.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating		1	1.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.3000e-003	0.0000	5.3000e-003	5.7000e-004	0.0000	5.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.8600e-003	0.0976	0.0425	1.0000e-004		4.1800e-003	4.1800e-003		3.8500e-003	3.8500e-003	0.0000	8.9150	8.9150	2.7800e-003	0.0000	8.9844
Total	7.8600e-003	0.0976	0.0425	1.0000e-004	5.3000e-003	4.1800e-003	9.4800e-003	5.7000e-004	3.8500e-003	4.4200e-003	0.0000	8.9150	8.9150	2.7800e-003	0.0000	8.9844

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.5000e-004	1.5400e-003	0.0000	3.7000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3448	0.3448	1.0000e-005	0.0000	0.3451
Total	2.1000e-004	1.5000e-004	1.5400e-003	0.0000	3.7000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3448	0.3448	1.0000e-005	0.0000	0.3451

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.8600e-003	0.0976	0.0425	1.0000e-004		4.1800e-003	4.1800e-003		3.8500e-003	3.8500e-003	0.0000	8.9150	8.9150	2.7800e-003	0.0000	8.9844
Total	7.8600e-003	0.0976	0.0425	1.0000e-004	2.3900e-003	4.1800e-003	6.5700e-003	2.6000e-004	3.8500e-003	4.1100e-003	0.0000	8.9150	8.9150	2.7800e-003	0.0000	8.9844

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-004	1.5000e-004	1.5400e-003	0.0000	3.7000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3448	0.3448	1.0000e-005	0.0000	0.3451
Total	2.1000e-004	1.5000e-004	1.5400e-003	0.0000	3.7000e-004	0.0000	3.7000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3448	0.3448	1.0000e-005	0.0000	0.3451

3.3 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0128	0.0000	0.0128	4.7100e-003	0.0000	4.7100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0106	0.0943	0.0778	1.2000e-004		6.2300e-003	6.2300e-003		5.9400e-003	5.9400e-003	0.0000	10.6082	10.6082	2.0400e-003	0.0000	10.6593
Total	0.0106	0.0943	0.0778	1.2000e-004	0.0128	6.2300e-003	0.0191	4.7100e-003	5.9400e-003	0.0107	0.0000	10.6082	10.6082	2.0400e-003	0.0000	10.6593

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-004	3.1000e-004	3.0800e-003	1.0000e-005	7.4000e-004	1.0000e-005	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.6896	0.6896	2.0000e-005	0.0000	0.6901
Total	4.2000e-004	3.1000e-004	3.0800e-003	1.0000e-005	7.4000e-004	1.0000e-005	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.6896	0.6896	2.0000e-005	0.0000	0.6901

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.7700e-003	0.0000	5.7700e-003	2.1200e-003	0.0000	2.1200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0106	0.0943	0.0778	1.2000e-004		6.2300e-003	6.2300e-003		5.9400e-003	5.9400e-003	0.0000	10.6082	10.6082	2.0400e-003	0.0000	10.6593
Total	0.0106	0.0943	0.0778	1.2000e-004	5.7700e-003	6.2300e-003	0.0120	2.1200e-003	5.9400e-003	8.0600e-003	0.0000	10.6082	10.6082	2.0400e-003	0.0000	10.6593

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-004	3.1000e-004	3.0800e-003	1.0000e-005	7.4000e-004	1.0000e-005	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.6896	0.6896	2.0000e-005	0.0000	0.6901
Total	4.2000e-004	3.1000e-004	3.0800e-003	1.0000e-005	7.4000e-004	1.0000e-005	7.4000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.6896	0.6896	2.0000e-005	0.0000	0.6901

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
--	-----	-----	----	-----	---------------	--------------	------------	----------------	---------------	-------------	----------	-----------	-----------	-----	-----	------

Category	tons/yr										MT/yr					
Off-Road	0.0542	0.5516	0.3876	5.7000e-004		0.0354	0.0354		0.0326	0.0326	0.0000	52.0058	52.0058	0.0162	0.0000	52.4106
Total	0.0542	0.5516	0.3876	5.7000e-004		0.0354	0.0354		0.0326	0.0326	0.0000	52.0058	52.0058	0.0162	0.0000	52.4106

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.2000e-004	6.4500e-003	1.3700e-003	1.0000e-005	4.7000e-003	4.0000e-005	4.7400e-003	5.3000e-004	4.0000e-005	5.7000e-004	0.0000	1.3165	1.3165	7.0000e-005	0.0000	1.3183
Worker	8.5000e-004	6.1000e-004	6.1600e-003	2.0000e-005	1.4700e-003	1.0000e-005	1.4800e-003	3.9000e-004	1.0000e-005	4.0000e-004	0.0000	1.3791	1.3791	4.0000e-005	0.0000	1.3802
Total	1.0700e-003	7.0600e-003	7.5300e-003	3.0000e-005	6.1700e-003	5.0000e-005	6.2200e-003	9.2000e-004	5.0000e-005	9.7000e-004	0.0000	2.6956	2.6956	1.1000e-004	0.0000	2.6985

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0542	0.5516	0.3876	5.7000e-004		0.0354	0.0354		0.0326	0.0326	0.0000	52.0058	52.0058	0.0162	0.0000	52.4105
Total	0.0542	0.5516	0.3876	5.7000e-004		0.0354	0.0354		0.0326	0.0326	0.0000	52.0058	52.0058	0.0162	0.0000	52.4105

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.2000e-004	6.4500e-003	1.3700e-003	1.0000e-005	4.7000e-003	4.0000e-005	4.7400e-003	5.3000e-004	4.0000e-005	5.7000e-004	0.0000	1.3165	1.3165	7.0000e-005	0.0000	1.3183
Worker	8.5000e-004	6.1000e-004	6.1600e-003	2.0000e-005	1.4700e-003	1.0000e-005	1.4800e-003	3.9000e-004	1.0000e-005	4.0000e-004	0.0000	1.3791	1.3791	4.0000e-005	0.0000	1.3802
Total	1.0700e-003	7.0600e-003	7.5300e-003	3.0000e-005	6.1700e-003	5.0000e-005	6.2200e-003	9.2000e-004	5.0000e-005	9.7000e-004	0.0000	2.6956	2.6956	1.1000e-004	0.0000	2.6985

3.5 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.0600e-003	0.0481	0.0397	6.0000e-005		2.8100e-003	2.8100e-003		2.6000e-003	2.6000e-003	0.0000	5.3395	5.3395	1.5100e-003	0.0000	5.3771
Paving	7.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	5.1300e-003	0.0481	0.0397	6.0000e-005		2.8100e-003	2.8100e-003		2.6000e-003	2.6000e-003	0.0000	5.3395	5.3395	1.5100e-003	0.0000	5.3771

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
--	-----	-----	----	-----	---------------	--------------	------------	----------------	---------------	-------------	----------	-----------	-----------	-----	-----	------

Category	tons/yr										MT/yr						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-004	3.0000e-004	3.0500e-003	1.0000e-005	7.3000e-004	1.0000e-005	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6827	0.6827	2.0000e-005	0.0000	0.6832	0.0000
Total	4.2000e-004	3.0000e-004	3.0500e-003	1.0000e-005	7.3000e-004	1.0000e-005	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6827	0.6827	2.0000e-005	0.0000	0.6832	0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Off-Road	5.0600e-003	0.0481	0.0397	6.0000e-005		2.8100e-003	2.8100e-003		2.6000e-003	2.6000e-003	0.0000	5.3395	5.3395	1.5100e-003	0.0000	5.3771	0.0000
Paving	7.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	5.1300e-003	0.0481	0.0397	6.0000e-005		2.8100e-003	2.8100e-003		2.6000e-003	2.6000e-003	0.0000	5.3395	5.3395	1.5100e-003	0.0000	5.3771	0.0000

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr										MT/yr						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-004	3.0000e-004	3.0500e-003	1.0000e-005	7.3000e-004	1.0000e-005	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6827	0.6827	2.0000e-005	0.0000	0.6832	0.0000

Total	4.2000e-004	3.0000e-004	3.0500e-003	1.0000e-005	7.3000e-004	1.0000e-005	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6827	0.6827	2.0000e-005	0.0000	0.6832
-------	-------------	-------------	-------------	-------------	-------------	-------------	-------------	-------------	--------	-------------	--------	--------	--------	-------------	--------	--------

3.6 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0121					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6400e-003	0.0110	0.0102	2.0000e-005		8.3000e-004	8.3000e-004		8.3000e-004	8.3000e-004	0.0000	1.4043	1.4043	1.3000e-004	0.0000	1.4076
Total	0.0137	0.0110	0.0102	2.0000e-005		8.3000e-004	8.3000e-004		8.3000e-004	8.3000e-004	0.0000	1.4043	1.4043	1.3000e-004	0.0000	1.4076

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	1.7000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0379	0.0379	0.0000	0.0000	0.0380
Total	2.0000e-005	2.0000e-005	1.7000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0379	0.0379	0.0000	0.0000	0.0380

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0121						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6400e-003	0.0110	0.0102	2.0000e-005		8.3000e-004	8.3000e-004		8.3000e-004	8.3000e-004	0.0000	1.4043	1.4043	1.3000e-004	0.0000	1.4076
Total	0.0137	0.0110	0.0102	2.0000e-005		8.3000e-004	8.3000e-004		8.3000e-004	8.3000e-004	0.0000	1.4043	1.4043	1.3000e-004	0.0000	1.4076

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	1.7000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0379	0.0379	0.0000	0.0000	0.0380
Total	2.0000e-005	2.0000e-005	1.7000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0379	0.0379	0.0000	0.0000	0.0380

3.7 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.0700e-003	0.0000	3.0700e-003	4.6000e-004	0.0000	4.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9800e-003	0.0707	0.0583	9.0000e-005		4.6700e-003	4.6700e-003		4.4600e-003	4.4600e-003	0.0000	7.9561	7.9561	1.5300e-003	0.0000	7.9945

Total	7.9800e-003	0.0707	0.0583	9.0000e-005	3.0700e-003	4.6700e-003	7.7400e-003	4.6000e-004	4.4600e-003	4.9200e-003	0.0000	7.9561	7.9561	1.5300e-003	0.0000	7.9945
--------------	--------------------	---------------	---------------	--------------------	--------------------	--------------------	--------------------	--------------------	--------------------	--------------------	---------------	---------------	---------------	--------------------	---------------	---------------

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1000e-004	3.7300e-003	6.4000e-004	1.0000e-005	3.2100e-003	2.0000e-005	3.2300e-003	3.6000e-004	2.0000e-005	3.7000e-004	0.0000	0.9611	0.9611	4.0000e-005	0.0000	0.9620
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	2.3000e-004	2.3100e-003	1.0000e-005	5.5000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.5172	0.5172	2.0000e-005	0.0000	0.5176
Total	4.3000e-004	3.9600e-003	2.9500e-003	2.0000e-005	3.7600e-003	2.0000e-005	3.7900e-003	5.1000e-004	2.0000e-005	5.2000e-004	0.0000	1.4783	1.4783	6.0000e-005	0.0000	1.4795

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3800e-003	0.0000	1.3800e-003	2.1000e-004	0.0000	2.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9800e-003	0.0707	0.0583	9.0000e-005		4.6700e-003	4.6700e-003		4.4600e-003	4.4600e-003	0.0000	7.9561	7.9561	1.5300e-003	0.0000	7.9945
Total	7.9800e-003	0.0707	0.0583	9.0000e-005	1.3800e-003	4.6700e-003	6.0500e-003	2.1000e-004	4.4600e-003	4.6700e-003	0.0000	7.9561	7.9561	1.5300e-003	0.0000	7.9945

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1000e-004	3.7300e-003	6.4000e-004	1.0000e-005	3.2100e-003	2.0000e-005	3.2300e-003	3.6000e-004	2.0000e-005	3.7000e-004	0.0000	0.9611	0.9611	4.0000e-005	0.0000	0.9620
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	2.3000e-004	2.3100e-003	1.0000e-005	5.5000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.5172	0.5172	2.0000e-005	0.0000	0.5176
Total	4.3000e-004	3.9600e-003	2.9500e-003	2.0000e-005	3.7600e-003	2.0000e-005	3.7900e-003	5.1000e-004	2.0000e-005	5.2000e-004	0.0000	1.4783	1.4783	6.0000e-005	0.0000	1.4795

UCD CORE 2 Greenhouse Construction - Yolo County, Summer

UCD CORE 2 Greenhouse Construction
Yolo County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	5.00	Employee	0.85	6,680.00	0
Parking Lot	0.05	Acre	0.05	2,178.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	6.8	Precipitation Freq (Days)	54
Climate Zone	2			Operational Year	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	499.66	CH4 Intensity (lb/MW hr)	0.023	N2O Intensity (lb/MW hr)	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Modeling construction only

Land Use - Site: 0.85 acres of greenhouses and 0.05 acres paved per year assumed

Construction Phase - Adjusted construction schedule to 7 month duration, followed by 3 weeks of demolition

Off-road Equipment - Default equipment assumed

On-road Fugitive Dust - Based on site location, changed % pave workers to 100%. % pave vendor and hauling changed to 99%, to account for any travel on unpaved areas on-site

Demolition - Demolition - 5,325 SF assumed after each 7 month construction period

Grading - 10 total acres graded (default)

Architectural Coating - Reduced architectural coating surfaces by 75%, since the majority of development would be greenhouses and would not require coatings

Vehicle Trips - Modeling construction only

Energy Use - Modeling energy outside of CalEEMod

Construction Off-road Equipment Mitigation - Water exposed area 2x per day

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	3,340.00	835.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	10,020.00	2,505.00
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblEnergyUse	NT24E	0.34	0.00
tblEnergyUse	T24E	3.94	0.00
tblGrading	AcresOfGrading	0.00	10.00
tblLandUse	BuildingSpaceSquareFeet	3,528.91	6,680.00
tblLandUse	LandUseSquareFeet	3,528.91	6,680.00
tblLandUse	LotAcreage	0.08	0.85
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.023

tblProjectCharacteristics	CO2IntensityFactor	641.35	499.66
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2018	2020
tblSolidWaste	SolidWasteGenerationRate	4.00	0.00
tblVehicleTrips	ST_TR	3.12	0.00
tblVehicleTrips	WD_TR	8.96	0.00
tblWater	IndoorWaterUseRate	41,109.12	0.00
tblWater	OutdoorWaterUseRate	64,298.88	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	2.4973	19.9635	15.7829	0.0248	1.3591	1.2216	1.9824	0.4912	1.1273	1.1839	0.0000	2,430.2534	2,430.2534	0.6659	0.0000	2,446.9010
Maximum	2.4973	19.9635	15.7829	0.0248	1.3591	1.2216	1.9824	0.4912	1.1273	1.1839	0.0000	2,430.2534	2,430.2534	0.6659	0.0000	2,446.9010

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	2.4973	19.9635	15.7829	0.0248	0.7588	1.2216	1.4984	0.2321	1.1273	1.1839	0.0000	2,430.2534	2,430.2534	0.6659	0.0000	2,446.9010
Maximum	2.4973	19.9635	15.7829	0.0248	0.7588	1.2216	1.4984	0.2321	1.1273	1.1839	0.0000	2,430.2534	2,430.2534	0.6659	0.0000	2,446.9010

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	44.17	0.00	24.41	52.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2018	1/26/2018	5	20	
2	Grading	Grading	1/27/2018	2/23/2018	5	20	
3	Building Construction	Building Construction	2/24/2018	7/13/2018	5	100	
4	Paving	Paving	7/1/2018	7/16/2018	5	11	
5	Architectural Coating	Architectural Coating	7/17/2018	7/31/2018	5	11	
6	Demolition	Demolition	8/1/2018	8/21/2018	5	15	

Acres of Grading (Site Preparation Phase): 10

Acres of Grading (Grading Phase): 10

Acres of Paving: 0.05

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 2,505; Non-Residential Outdoor: 835; Striped Parking Area: 131

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42

Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	24.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	4.00	1.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5303	0.0000	0.5303	0.0573	0.0000	0.0573			0.0000			0.0000
Off-Road	0.7858	9.7572	4.2514	9.7600e-003		0.4180	0.4180		0.3846	0.3846		982.7113	982.7113	0.3059		990.3596
Total	0.7858	9.7572	4.2514	9.7600e-003	0.5303	0.4180	0.9483	0.0573	0.3846	0.4418		982.7113	982.7113	0.3059		990.3596

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0244	0.0138	0.1777	4.2000e-004	0.0380	2.6000e-004	0.0383	0.0101	2.4000e-004	0.0103		41.8677	41.8677	1.3000e-003		41.9002
Total	0.0244	0.0138	0.1777	4.2000e-004	0.0380	2.6000e-004	0.0383	0.0101	2.4000e-004	0.0103		41.8677	41.8677	1.3000e-003		41.9002

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2386	0.0000	0.2386	0.0258	0.0000	0.0258			0.0000			0.0000
Off-Road	0.7858	9.7572	4.2514	9.7600e-003		0.4180	0.4180		0.3846	0.3846	0.0000	982.7113	982.7113	0.3059		990.3596
Total	0.7858	9.7572	4.2514	9.7600e-003	0.2386	0.4180	0.6566	0.0258	0.3846	0.4103	0.0000	982.7113	982.7113	0.3059		990.3596

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0244	0.0138	0.1777	4.2000e-004	0.0380	2.6000e-004	0.0383	0.0101	2.4000e-004	0.0103		41.8677	41.8677	1.3000e-003		41.9002
Total	0.0244	0.0138	0.1777	4.2000e-004	0.0380	2.6000e-004	0.0383	0.0101	2.4000e-004	0.0103		41.8677	41.8677	1.3000e-003		41.9002

3.3 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.2830	0.0000	1.2830	0.4710	0.0000	0.4710			0.0000			0.0000
Off-Road	1.0643	9.4295	7.7762	0.0120		0.6228	0.6228		0.5943	0.5943		1,169.3502	1,169.3502	0.2254		1,174.9857
Total	1.0643	9.4295	7.7762	0.0120	1.2830	0.6228	1.9058	0.4710	0.5943	1.0653		1,169.3502	1,169.3502	0.2254		1,174.9857

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0489	0.0277	0.3555	8.4000e-004	0.0761	5.2000e-004	0.0766	0.0202	4.8000e-004	0.0207		83.7354	83.7354	2.6000e-003		83.8004
Total	0.0489	0.0277	0.3555	8.4000e-004	0.0761	5.2000e-004	0.0766	0.0202	4.8000e-004	0.0207		83.7354	83.7354	2.6000e-003		83.8004

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5774	0.0000	0.5774	0.2120	0.0000	0.2120			0.0000			0.0000
Off-Road	1.0643	9.4295	7.7762	0.0120		0.6228	0.6228		0.5943	0.5943	0.0000	1,169.3502	1,169.3502	0.2254		1,174.9857
Total	1.0643	9.4295	7.7762	0.0120	0.5774	0.6228	1.2001	0.2120	0.5943	0.8063	0.0000	1,169.3502	1,169.3502	0.2254		1,174.9857

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0489	0.0277	0.3555	8.4000e-004	0.0761	5.2000e-004	0.0766	0.0202	4.8000e-004	0.0207		83.7354	83.7354	2.6000e-003		83.8004
Total	0.0489	0.0277	0.3555	8.4000e-004	0.0761	5.2000e-004	0.0766	0.0202	4.8000e-004	0.0207		83.7354	83.7354	2.6000e-003		83.8004

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
--	-----	-----	----	-----	---------------	--------------	------------	----------------	---------------	-------------	----------	-----------	-----------	-----	-----	------

Category	lb/day										lb/day					
Off-Road	1.0848	11.0316	7.7512	0.0114		0.7087	0.7087		0.6520	0.6520		1,146.5323	1,146.5323	0.3569		1,155.4555
Total	1.0848	11.0316	7.7512	0.0114		0.7087	0.7087		0.6520	0.6520		1,146.5323	1,146.5323	0.3569		1,155.4555

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.3500e-003	0.1263	0.0257	2.8000e-004	0.1095	8.4000e-004	0.1103	0.0121	8.0000e-004	0.0129		29.3661	29.3661	1.5500e-003		29.4049
Worker	0.0195	0.0111	0.1422	3.4000e-004	0.0304	2.1000e-004	0.0306	8.0700e-003	1.9000e-004	8.2600e-003		33.4942	33.4942	1.0400e-003		33.5202
Total	0.0239	0.1374	0.1679	6.2000e-004	0.1399	1.0500e-003	0.1409	0.0202	9.9000e-004	0.0212		62.8602	62.8602	2.5900e-003		62.9250

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0848	11.0316	7.7512	0.0114		0.7087	0.7087		0.6520	0.6520	0.0000	1,146.5323	1,146.5323	0.3569		1,155.4555
Total	1.0848	11.0316	7.7512	0.0114		0.7087	0.7087		0.6520	0.6520	0.0000	1,146.5323	1,146.5323	0.3569		1,155.4555

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000			0.0000
Vendor	4.3500e-003	0.1263	0.0257	2.8000e-004	0.1095	8.4000e-004	0.1103	0.0121	8.0000e-004	0.0129		29.3661	29.3661	1.5500e-003			29.4049
Worker	0.0195	0.0111	0.1422	3.4000e-004	0.0304	2.1000e-004	0.0306	8.0700e-003	1.9000e-004	8.2600e-003		33.4942	33.4942	1.0400e-003			33.5202
Total	0.0239	0.1374	0.1679	6.2000e-004	0.1399	1.0500e-003	0.1409	0.0202	9.9000e-004	0.0212		62.8602	62.8602	2.5900e-003			62.9250

3.5 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Off-Road	0.9202	8.7447	7.2240	0.0113		0.5109	0.5109		0.4735	0.4735		1,070.1372	1,070.1372	0.3017			1,077.6798
Paving	0.0119					0.0000	0.0000		0.0000	0.0000			0.0000				0.0000
Total	0.9321	8.7447	7.2240	0.0113		0.5109	0.5109		0.4735	0.4735		1,070.1372	1,070.1372	0.3017			1,077.6798

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
--	-----	-----	----	-----	---------------	--------------	------------	----------------	---------------	-------------	----------	-----------	-----------	-----	-----	------

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0879	0.0498	0.6399	1.5100e-003	0.1369	9.3000e-004	0.1379	0.0363	8.6000e-004	0.0372		150.7237	150.7237	4.6800e-003		150.8407
Total	0.0879	0.0498	0.6399	1.5100e-003	0.1369	9.3000e-004	0.1379	0.0363	8.6000e-004	0.0372		150.7237	150.7237	4.6800e-003		150.8407

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9202	8.7447	7.2240	0.0113		0.5109	0.5109		0.4735	0.4735	0.0000	1,070.1372	1,070.1372	0.3017		1,077.6798
Paving	0.0119					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.9321	8.7447	7.2240	0.0113		0.5109	0.5109		0.4735	0.4735	0.0000	1,070.1372	1,070.1372	0.3017		1,077.6798

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0879	0.0498	0.6399	1.5100e-003	0.1369	9.3000e-004	0.1379	0.0363	8.6000e-004	0.0372		150.7237	150.7237	4.6800e-003		150.8407

Total	0.0879	0.0498	0.6399	1.5100e-003	0.1369	9.3000e-004	0.1379	0.0363	8.6000e-004	0.0372		150.7237	150.7237	4.6800e-003		150.8407
-------	--------	--------	--------	-------------	--------	-------------	--------	--------	-------------	--------	--	----------	----------	-------------	--	----------

3.6 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.1938					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.1171
Total	2.4925	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.1171

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.8800e-003	2.7700e-003	0.0356	8.0000e-005	7.6100e-003	5.0000e-005	7.6600e-003	2.0200e-003	5.0000e-005	2.0700e-003		8.3735	8.3735	2.6000e-004		8.3800
Total	4.8800e-003	2.7700e-003	0.0356	8.0000e-005	7.6100e-003	5.0000e-005	7.6600e-003	2.0200e-003	5.0000e-005	2.0700e-003		8.3735	8.3735	2.6000e-004		8.3800

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.1938					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.1171
Total	2.4925	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.1171

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.8800e-003	2.7700e-003	0.0356	8.0000e-005	7.6100e-003	5.0000e-005	7.6600e-003	2.0200e-003	5.0000e-005	2.0700e-003		8.3735	8.3735	2.6000e-004		8.3800
Total	4.8800e-003	2.7700e-003	0.0356	8.0000e-005	7.6100e-003	5.0000e-005	7.6600e-003	2.0200e-003	5.0000e-005	2.0700e-003		8.3735	8.3735	2.6000e-004		8.3800

3.7 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.4093	0.0000	0.4093	0.0620	0.0000	0.0620			0.0000			0.0000
Off-Road	1.0643	9.4295	7.7762	0.0120		0.6228	0.6228		0.5943	0.5943		1,169.3502	1,169.3502	0.2254		1,174.9857

Total	1.0643	9.4295	7.7762	0.0120	0.4093	0.6228	1.0321	0.0620	0.5943	0.6563		1,169.350	1,169.350	0.2254		1,174.985
												2	2			7

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0144	0.4809	0.0818	1.3600e-003	0.4986	2.1600e-003	0.5007	0.0546	2.0700e-003	0.0566		142.3057	142.3057	4.9600e-003		142.4296
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0489	0.0277	0.3555	8.4000e-004	0.0761	5.2000e-004	0.0766	0.0202	4.8000e-004	0.0207		83.7354	83.7354	2.6000e-003		83.8004
Total	0.0633	0.5085	0.4373	2.2000e-003	0.5746	2.6800e-003	0.5773	0.0747	2.5500e-003	0.0773		226.0411	226.0411	7.5600e-003		226.2300

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1842	0.0000	0.1842	0.0279	0.0000	0.0279			0.0000			0.0000
Off-Road	1.0643	9.4295	7.7762	0.0120		0.6228	0.6228		0.5943	0.5943	0.0000	1,169.350	1,169.350	0.2254		1,174.985
												2	2			7
Total	1.0643	9.4295	7.7762	0.0120	0.1842	0.6228	0.8070	0.0279	0.5943	0.6222	0.0000	1,169.350	1,169.350	0.2254		1,174.985
												2	2			7

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0144	0.4809	0.0818	1.3600e-003	0.4986	2.1600e-003	0.5007	0.0546	2.0700e-003	0.0566		142.3057	142.3057	4.9600e-003		142.4296
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0489	0.0277	0.3555	8.4000e-004	0.0761	5.2000e-004	0.0766	0.0202	4.8000e-004	0.0207		83.7354	83.7354	2.6000e-003		83.8004
Total	0.0633	0.5085	0.4373	2.2000e-003	0.5746	2.6800e-003	0.5773	0.0747	2.5500e-003	0.0773		226.0411	226.0411	7.5600e-003		226.2300

UCD CORE 2 Greenhouse Construction - Yolo County, Winter

UCD CORE 2 Greenhouse Construction
Yolo County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	5.00	Employee	0.85	6,680.00	0
Parking Lot	0.05	Acre	0.05	2,178.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	6.8	Precipitation Freq (Days)	54
Climate Zone	2			Operational Year	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	499.66	CH4 Intensity (lb/MW hr)	0.023	N2O Intensity (lb/MW hr)	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Modeling construction only

Land Use - Site: 0.85 acres of greenhouses and 0.05 acres paved per year assumed

Construction Phase - Adjusted construction schedule to 7 month duration, followed by 3 weeks of demolition

Off-road Equipment - Default equipment assumed

On-road Fugitive Dust - Based on site location, changed % pave workers to 100%. % pave vendor and hauling changed to 99%, to account for any travel on unpaved areas on-site

Demolition - Demolition - 5,325 SF assumed after each 7 month construction period

Grading - 10 total acres graded (default)

Architectural Coating - Reduced architectural coating surfaces by 75%, since the majority of development would be greenhouses and would not require coatings

Vehicle Trips - Modeling construction only

Energy Use - Modeling energy outside of CalEEMod

Construction Off-road Equipment Mitigation - Water exposed area 2x per day

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	3,340.00	835.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	10,020.00	2,505.00
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblEnergyUse	NT24E	0.34	0.00
tblEnergyUse	T24E	3.94	0.00
tblGrading	AcresOfGrading	0.00	10.00
tblLandUse	BuildingSpaceSquareFeet	3,528.91	6,680.00
tblLandUse	LandUseSquareFeet	3,528.91	6,680.00
tblLandUse	LotAcreage	0.08	0.85
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	HaulingPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	VendorPercentPave	94.00	99.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblOnRoadDust	WorkerPercentPave	94.00	100.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.023

tblProjectCharacteristics	CO2IntensityFactor	641.35	499.66
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2018	2020
tblSolidWaste	SolidWasteGenerationRate	4.00	0.00
tblVehicleTrips	ST_TR	3.12	0.00
tblVehicleTrips	WD_TR	8.96	0.00
tblWater	IndoorWaterUseRate	41,109.12	0.00
tblWater	OutdoorWaterUseRate	64,298.88	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	2.4970	19.9810	15.7022	0.0246	1.3591	1.2216	1.9824	0.4912	1.1274	1.1839	0.0000	2,407.822 2	2,407.822 2	0.6656	0.0000	2,424.461 4
Maximum	2.4970	19.9810	15.7022	0.0246	1.3591	1.2216	1.9824	0.4912	1.1274	1.1839	0.0000	2,407.822 2	2,407.822 2	0.6656	0.0000	2,424.461 4

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	2.4970	19.9810	15.7022	0.0246	0.7588	1.2216	1.4984	0.2321	1.1274	1.1839	0.0000	2,407.822 2	2,407.822 2	0.6656	0.0000	2,424.461 4
Maximum	2.4970	19.9810	15.7022	0.0246	0.7588	1.2216	1.4984	0.2321	1.1274	1.1839	0.0000	2,407.822 2	2,407.822 2	0.6656	0.0000	2,424.461 4

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	44.17	0.00	24.41	52.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2018	1/26/2018	5	20	
2	Grading	Grading	1/27/2018	2/23/2018	5	20	
3	Building Construction	Building Construction	2/24/2018	7/13/2018	5	100	
4	Paving	Paving	7/1/2018	7/16/2018	5	11	
5	Architectural Coating	Architectural Coating	7/17/2018	7/31/2018	5	11	
6	Demolition	Demolition	8/1/2018	8/21/2018	5	15	

Acres of Grading (Site Preparation Phase): 10

Acres of Grading (Grading Phase): 10

Acres of Paving: 0.05

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 2,505; Non-Residential Outdoor: 835; Striped Parking Area: 131

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	130	0.42

Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	24.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	4.00	1.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.00	7.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5303	0.0000	0.5303	0.0573	0.0000	0.0573			0.0000			0.0000
Off-Road	0.7858	9.7572	4.2514	9.7600e-003		0.4180	0.4180		0.3846	0.3846		982.7113	982.7113	0.3059		990.3596
Total	0.7858	9.7572	4.2514	9.7600e-003	0.5303	0.4180	0.9483	0.0573	0.3846	0.4418		982.7113	982.7113	0.3059		990.3596

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0227	0.0172	0.1583	3.7000e-004	0.0380	2.6000e-004	0.0383	0.0101	2.4000e-004	0.0103		36.9551	36.9551	1.1800e-003		36.9845
Total	0.0227	0.0172	0.1583	3.7000e-004	0.0380	2.6000e-004	0.0383	0.0101	2.4000e-004	0.0103		36.9551	36.9551	1.1800e-003		36.9845

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2386	0.0000	0.2386	0.0258	0.0000	0.0258			0.0000			0.0000
Off-Road	0.7858	9.7572	4.2514	9.7600e-003		0.4180	0.4180		0.3846	0.3846	0.0000	982.7113	982.7113	0.3059		990.3596
Total	0.7858	9.7572	4.2514	9.7600e-003	0.2386	0.4180	0.6566	0.0258	0.3846	0.4103	0.0000	982.7113	982.7113	0.3059		990.3596

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0227	0.0172	0.1583	3.7000e-004	0.0380	2.6000e-004	0.0383	0.0101	2.4000e-004	0.0103		36.9551	36.9551	1.1800e-003		36.9845
Total	0.0227	0.0172	0.1583	3.7000e-004	0.0380	2.6000e-004	0.0383	0.0101	2.4000e-004	0.0103		36.9551	36.9551	1.1800e-003		36.9845

3.3 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.2830	0.0000	1.2830	0.4710	0.0000	0.4710			0.0000			0.0000
Off-Road	1.0643	9.4295	7.7762	0.0120		0.6228	0.6228		0.5943	0.5943		1,169.3502	1,169.3502	0.2254		1,174.9857
Total	1.0643	9.4295	7.7762	0.0120	1.2830	0.6228	1.9058	0.4710	0.5943	1.0653		1,169.3502	1,169.3502	0.2254		1,174.9857

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0454	0.0345	0.3166	7.4000e-004	0.0761	5.2000e-004	0.0766	0.0202	4.8000e-004	0.0207		73.9101	73.9101	2.3600e-003		73.9690
Total	0.0454	0.0345	0.3166	7.4000e-004	0.0761	5.2000e-004	0.0766	0.0202	4.8000e-004	0.0207		73.9101	73.9101	2.3600e-003		73.9690

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5774	0.0000	0.5774	0.2120	0.0000	0.2120			0.0000			0.0000
Off-Road	1.0643	9.4295	7.7762	0.0120		0.6228	0.6228		0.5943	0.5943	0.0000	1,169.3502	1,169.3502	0.2254		1,174.9857
Total	1.0643	9.4295	7.7762	0.0120	0.5774	0.6228	1.2001	0.2120	0.5943	0.8063	0.0000	1,169.3502	1,169.3502	0.2254		1,174.9857

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0454	0.0345	0.3166	7.4000e-004	0.0761	5.2000e-004	0.0766	0.0202	4.8000e-004	0.0207		73.9101	73.9101	2.3600e-003		73.9690
Total	0.0454	0.0345	0.3166	7.4000e-004	0.0761	5.2000e-004	0.0766	0.0202	4.8000e-004	0.0207		73.9101	73.9101	2.3600e-003		73.9690

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
--	-----	-----	----	-----	---------------	--------------	------------	----------------	---------------	-------------	----------	-----------	-----------	-----	-----	------

Category	lb/day										lb/day					
Off-Road	1.0848	11.0316	7.7512	0.0114		0.7087	0.7087		0.6520	0.6520		1,146.5323	1,146.5323	0.3569		1,155.4555
Total	1.0848	11.0316	7.7512	0.0114		0.7087	0.7087		0.6520	0.6520		1,146.5323	1,146.5323	0.3569		1,155.4555

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.5800e-003	0.1288	0.0304	2.7000e-004	0.1095	8.6000e-004	0.1103	0.0121	8.2000e-004	0.0130		28.5504	28.5504	1.7500e-003		28.5942
Worker	0.0181	0.0138	0.1267	3.0000e-004	0.0304	2.1000e-004	0.0306	8.0700e-003	1.9000e-004	8.2600e-003		29.5641	29.5641	9.4000e-004		29.5876
Total	0.0227	0.1426	0.1570	5.7000e-004	0.1399	1.0700e-003	0.1409	0.0202	1.0100e-003	0.0212		58.1145	58.1145	2.6900e-003		58.1818

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0848	11.0316	7.7512	0.0114		0.7087	0.7087		0.6520	0.6520	0.0000	1,146.5323	1,146.5323	0.3569		1,155.4555
Total	1.0848	11.0316	7.7512	0.0114		0.7087	0.7087		0.6520	0.6520	0.0000	1,146.5323	1,146.5323	0.3569		1,155.4555

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	4.5800e-003	0.1288	0.0304	2.7000e-004	0.1095	8.6000e-004	0.1103	0.0121	8.2000e-004	0.0130		28.5504	28.5504	1.7500e-003		28.5942
Worker	0.0181	0.0138	0.1267	3.0000e-004	0.0304	2.1000e-004	0.0306	8.0700e-003	1.9000e-004	8.2600e-003		29.5641	29.5641	9.4000e-004		29.5876
Total	0.0227	0.1426	0.1570	5.7000e-004	0.1399	1.0700e-003	0.1409	0.0202	1.0100e-003	0.0212		58.1145	58.1145	2.6900e-003		58.1818

3.5 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9202	8.7447	7.2240	0.0113		0.5109	0.5109		0.4735	0.4735		1,070.1372	1,070.1372	0.3017		1,077.6798
Paving	0.0119					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.9321	8.7447	7.2240	0.0113		0.5109	0.5109		0.4735	0.4735		1,070.1372	1,070.1372	0.3017		1,077.6798

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
--	-----	-----	----	-----	---------------	--------------	------------	----------------	---------------	-------------	----------	-----------	-----------	-----	-----	------

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0816	0.0621	0.5700	1.3400e-003	0.1369	9.3000e-004	0.1379	0.0363	8.6000e-004	0.0372		133.0382	133.0382	4.2400e-003		133.1442
Total	0.0816	0.0621	0.5700	1.3400e-003	0.1369	9.3000e-004	0.1379	0.0363	8.6000e-004	0.0372		133.0382	133.0382	4.2400e-003		133.1442

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9202	8.7447	7.2240	0.0113		0.5109	0.5109		0.4735	0.4735	0.0000	1,070.1372	1,070.1372	0.3017		1,077.6798
Paving	0.0119					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	0.9321	8.7447	7.2240	0.0113		0.5109	0.5109		0.4735	0.4735	0.0000	1,070.1372	1,070.1372	0.3017		1,077.6798

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0816	0.0621	0.5700	1.3400e-003	0.1369	9.3000e-004	0.1379	0.0363	8.6000e-004	0.0372		133.0382	133.0382	4.2400e-003		133.1442

Total	0.0816	0.0621	0.5700	1.3400e-003	0.1369	9.3000e-004	0.1379	0.0363	8.6000e-004	0.0372		133.0382	133.0382	4.2400e-003		133.1442
-------	--------	--------	--------	-------------	--------	-------------	--------	--------	-------------	--------	--	----------	----------	-------------	--	----------

3.6 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.1938					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.1171
Total	2.4925	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.1171

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.5400e-003	3.4500e-003	0.0317	7.0000e-005	7.6100e-003	5.0000e-005	7.6600e-003	2.0200e-003	5.0000e-005	2.0700e-003		7.3910	7.3910	2.4000e-004		7.3969
Total	4.5400e-003	3.4500e-003	0.0317	7.0000e-005	7.6100e-003	5.0000e-005	7.6600e-003	2.0200e-003	5.0000e-005	2.0700e-003		7.3910	7.3910	2.4000e-004		7.3969

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.1938					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.1171
Total	2.4925	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.1171

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	4.5400e-003	3.4500e-003	0.0317	7.0000e-005	7.6100e-003	5.0000e-005	7.6600e-003	2.0200e-003	5.0000e-005	2.0700e-003		7.3910	7.3910	2.4000e-004		7.3969
Total	4.5400e-003	3.4500e-003	0.0317	7.0000e-005	7.6100e-003	5.0000e-005	7.6600e-003	2.0200e-003	5.0000e-005	2.0700e-003		7.3910	7.3910	2.4000e-004		7.3969

3.7 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.4093	0.0000	0.4093	0.0620	0.0000	0.0620			0.0000			0.0000
Off-Road	1.0643	9.4295	7.7762	0.0120		0.6228	0.6228		0.5943	0.5943		1,169.3502	1,169.3502	0.2254		1,174.9857

Total	1.0643	9.4295	7.7762	0.0120	0.4093	0.6228	1.0321	0.0620	0.5943	0.6563		1,169.350	1,169.350	0.2254		1,174.985
												2	2			7

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	lb/day										lb/day						
Hauling	0.0149	0.5002	0.0915	1.3300e-003	0.4986	2.2200e-003	0.5008	0.0546	2.1300e-003	0.0567			139.7986	139.7986	5.5400e-003		139.9371
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000		0.0000
Worker	0.0454	0.0345	0.3166	7.4000e-004	0.0761	5.2000e-004	0.0766	0.0202	4.8000e-004	0.0207			73.9101	73.9101	2.3600e-003		73.9690
Total	0.0603	0.5347	0.4081	2.0700e-003	0.5746	2.7400e-003	0.5774	0.0747	2.6100e-003	0.0773			213.7088	213.7088	7.9000e-003		213.9061

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1842	0.0000	0.1842	0.0279	0.0000	0.0279			0.0000			0.0000
Off-Road	1.0643	9.4295	7.7762	0.0120		0.6228	0.6228		0.5943	0.5943	0.0000	1,169.350	1,169.350	0.2254		1,174.985
												2	2			7
Total	1.0643	9.4295	7.7762	0.0120	0.1842	0.6228	0.8070	0.0279	0.5943	0.6222	0.0000	1,169.350	1,169.350	0.2254		1,174.985
												2	2			7

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0149	0.5002	0.0915	1.3300e-003	0.4986	2.2200e-003	0.5008	0.0546	2.1300e-003	0.0567		139.7986	139.7986	5.5400e-003		139.9371
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0454	0.0345	0.3166	7.4000e-004	0.0761	5.2000e-004	0.0766	0.0202	4.8000e-004	0.0207		73.9101	73.9101	2.3600e-003		73.9690
Total	0.0603	0.5347	0.4081	2.0700e-003	0.5746	2.7400e-003	0.5774	0.0747	2.6100e-003	0.0773		213.7088	213.7088	7.9000e-003		213.9061

UCD CORE 2 Greenhouse Construction Yolo County, Mitigation Report

Construction Mitigation Summary

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demolition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OFFROAD Equipment Mitigation

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Air Compressors	Diesel	No Change	0	1	No Change	0.00
Cement and Mortar Mixers	Diesel	No Change	0	4	No Change	0.00
Concrete/Industrial Saws	Diesel	No Change	0	2	No Change	0.00
Cranes	Diesel	No Change	0	1	No Change	0.00
Forklifts	Diesel	No Change	0	2	No Change	0.00
Graders	Diesel	No Change	0	1	No Change	0.00
Pavers	Diesel	No Change	0	1	No Change	0.00

Rollers	Diesel	No Change	0	1	No Change	0.00
Rubber Tired Dozers	Diesel	No Change	0	2	No Change	0.00
Tractors/Loaders/Backhoes	Diesel	No Change	0	8	No Change	0.00

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Unmitigated tons/yr							Unmitigated mt/yr					
Air Compressors	1.64000E-003	1.10300E-002	1.02000E-002	2.00000E-005	8.30000E-004	8.30000E-004	0.00000E+000	1.40429E+000	1.40429E+000	1.30000E-004	0.00000E+000	1.40763E+000
Cement and Mortar Mixers	9.70000E-004	6.08000E-003	5.09000E-003	1.00000E-005	2.40000E-004	2.40000E-004	0.00000E+000	7.56160E-001	7.56160E-001	8.00000E-005	0.00000E+000	7.58120E-001
Concrete/Industrial Saws	9.09000E-003	6.85100E-002	6.51700E-002	1.10000E-004	4.67000E-003	4.67000E-003	0.00000E+000	9.40899E+000	9.40899E+000	7.30000E-004	0.00000E+000	9.42720E+000
Cranes	1.42700E-002	1.70520E-001	6.30500E-002	1.40000E-004	7.38000E-003	6.79000E-003	0.00000E+000	1.31677E+001	1.31677E+001	4.10000E-003	0.00000E+000	1.32702E+001
Forklifts	1.33600E-002	1.18090E-001	9.08400E-002	1.10000E-004	9.42000E-003	8.67000E-003	0.00000E+000	1.04635E+001	1.04635E+001	3.26000E-003	0.00000E+000	1.05450E+001
Graders	5.20000E-003	7.12800E-002	1.91500E-002	7.00000E-005	2.32000E-003	2.13000E-003	0.00000E+000	6.07755E+000	6.07755E+000	1.89000E-003	0.00000E+000	6.12485E+000
Pavers	1.57000E-003	1.73700E-002	1.40800E-002	2.00000E-005	8.50000E-004	7.80000E-004	0.00000E+000	2.06562E+000	2.06562E+000	6.40000E-004	0.00000E+000	2.08169E+000
Rollers	1.24000E-003	1.20000E-002	9.31000E-003	1.00000E-005	8.30000E-004	7.60000E-004	0.00000E+000	1.15217E+000	1.15217E+000	3.60000E-004	0.00000E+000	1.16114E+000
Rubber Tired Dozers	2.55000E-003	2.74700E-002	9.57000E-003	2.00000E-005	1.34000E-003	1.23000E-003	0.00000E+000	1.70699E+000	1.70699E+000	5.30000E-004	0.00000E+000	1.72027E+000
Tractors/Loaders/Backhoes	3.75400E-002	3.70960E-001	3.29620E-001	4.40000E-004	2.62800E-002	2.41800E-002	0.00000E+000	4.00259E+001	4.00259E+001	1.24600E-002	0.00000E+000	4.03374E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Mitigated tons/yr							Mitigated mt/yr					
Air Compressors	1.64000E-003	1.10300E-002	1.02000E-002	2.00000E-005	8.30000E-004	8.30000E-004	0.00000E+000	1.40429E+000	1.40429E+000	1.30000E-004	0.00000E+000	1.40763E+000
Cement and Mortar Mixers	9.70000E-004	6.08000E-003	5.09000E-003	1.00000E-005	2.40000E-004	2.40000E-004	0.00000E+000	7.56160E-001	7.56160E-001	8.00000E-005	0.00000E+000	7.58120E-001
Concrete/Industrial Saws	9.09000E-003	6.85100E-002	6.51700E-002	1.10000E-004	4.67000E-003	4.67000E-003	0.00000E+000	9.40897E+000	9.40897E+000	7.30000E-004	0.00000E+000	9.42719E+000
Cranes	1.42700E-002	1.70520E-001	6.30500E-002	1.40000E-004	7.38000E-003	6.79000E-003	0.00000E+000	1.31677E+001	1.31677E+001	4.10000E-003	0.00000E+000	1.32702E+001
Forklifts	1.33600E-002	1.18090E-001	9.08400E-002	1.10000E-004	9.42000E-003	8.67000E-003	0.00000E+000	1.04635E+001	1.04635E+001	3.26000E-003	0.00000E+000	1.05450E+001
Graders	5.20000E-003	7.12800E-002	1.91500E-002	7.00000E-005	2.32000E-003	2.13000E-003	0.00000E+000	6.07754E+000	6.07754E+000	1.89000E-003	0.00000E+000	6.12484E+000
Pavers	1.57000E-003	1.73700E-002	1.40800E-002	2.00000E-005	8.50000E-004	7.80000E-004	0.00000E+000	2.06561E+000	2.06561E+000	6.40000E-004	0.00000E+000	2.08169E+000
Rollers	1.24000E-003	1.20000E-002	9.31000E-003	1.00000E-005	8.30000E-004	7.60000E-004	0.00000E+000	1.15217E+000	1.15217E+000	3.60000E-004	0.00000E+000	1.16114E+000

Rubber Tired Dozers	2.55000E-003	2.74700E-002	9.57000E-003	2.00000E-005	1.34000E-003	1.23000E-003	0.00000E+000	1.70698E+000	1.70698E+000	5.30000E-004	0.00000E+000	1.72027E+000
Tractors/Loaders/Bac khoes	3.75400E-002	3.70960E-001	3.29620E-001	4.40000E-004	2.62800E-002	2.41800E-002	0.00000E+000	4.00258E+001	4.00258E+001	1.24600E-002	0.00000E+000	4.03373E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Air Compressors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Cement and Mortar Mixers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Concrete/Industrial Saws	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	2.12563E-006	2.12563E-006	0.00000E+000	0.00000E+000	1.06076E-006
Cranes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.51886E-006	1.51886E-006	0.00000E+000	0.00000E+000	7.53567E-007
Forklifts	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	9.55700E-007	9.55700E-007	0.00000E+000	0.00000E+000	1.89664E-006
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.64540E-006	1.64540E-006	0.00000E+000	0.00000E+000	1.63269E-006
Pavers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	4.84116E-006	4.84116E-006	0.00000E+000	0.00000E+000	0.00000E+000
Rollers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	5.85827E-006	5.85827E-006	0.00000E+000	0.00000E+000	0.00000E+000
Tractors/Loaders/Bac khoes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.24919E-006	1.24919E-006	0.00000E+000	0.00000E+000	1.23955E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input	Mitigation Input	Mitigation Input			
No	Soil Stabilizer for unpaved Roads	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
No	Replace Ground Cover of Area Disturbed	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
Yes	Water Exposed Area	PM10 Reduction	55.00	PM2.5 Reduction	55.00	Frequency (per day)	2.00
No	Unpaved Road Mitigation	Moisture Content %	0.50	Vehicle Speed (mph)	40.00		
Yes	Clean Paved Road	% PM Reduction	0.00				

Phase	Source	Unmitigated		Mitigated		Percent Reduction	
		PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Architectural Coating	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Roads	0.00	0.00	0.01	0.00	0.00	0.00
Demolition	Fugitive Dust	0.00	0.00	0.00	0.00	0.55	0.54
Demolition	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Grading	Fugitive Dust	0.01	0.00	0.01	0.00	0.55	0.55
Grading	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	Fugitive Dust	0.00	0.00	0.00	0.00	0.55	0.54
Site Preparation	Roads	0.00	0.00	0.00	0.00	0.00	0.00

UC Davis CORE-2 Greenhouses Project: Dimensions

Orchard Park - to be demolished

Dimensions	Sq Feet	Qty	Total Sq Feet
13'x32'	416	70	29,120
35'x103'	3,605	1	3,605
23'x60'	1,380	1	1,380
41'x61'	2,501	1	2,501
55'x61'	3,355	1	3,355
43'x92'	3,956	1	3,956
21'x69'	1,449	1	1,449
34'x81'	2,754	2	5,508
20'x60'	1,200	1	1,200
28'x42'	1,176	1	1,176
Total Greenhouse SF			53,250

Proposed - Cacao Germplasm Greenhouses

Sq Feet	Qty	Total Sq Feet
10,000	2	20,000

Proposed - Core 2 Greenhouses - Phase 1

Sq Feet	Qty	Total Sq Feet
1,200	9	10,800

Proposed - Core 2 Future Expansion

Sq Feet	Qty	Total Sq Feet
1,200	30	36,000
Total Greenhouse SF		66,800

Demolition/Construction Schedule

Start - October 2017 End - September 2027

Construction - Annual SF Assumed:	6680 SF/year
Demolition - Annual SF Assumed:	5325 SF/year
8.5 total acres (estimate)	0.85 ac/year
0.5 acres paved (estimate)	0.05 ac/year

UC Davis CORE-2 Greenhouses Project: Natural Gas Estimate

GSF	Qty	Total Sq Feet
3,600	1	3,600 Tall Corn Greenhouse
460	1	460 JBEI Greenhouse A
460	1	460 JBEI Greenhouse B
Total Greenhouse SF		4,520

Natural Gas Metered Usage (Therms)

Greenhouse	10/11	11/12	12/13	13/14	14/15	15/16	16/17	Grand Total	Average Annual
JBEI Green	838	2226	1844.02	1526	932	727	387	8480.02	1211.431
JBEI Green	589	2040	1665.01	1808	1157	1780	1482	10521.01	1503.001
Tall Corn Greenhouse				1725	5389	2331	6583	16028	4007
								Average Annual Therms/SF	1.487043

Orchard Park

Total SF	Annual Therms
53,250	79,185

Proposed - Cacao Germplasm Greenhouses

Total SF	Annual Therms
20,000	29,741

Proposed - Core 2 Greenhouses - Phase 1

Total SF	Annual Therms
10,800	16,060

Proposed - Core 2 Future Expansion

Total SF	Annual Therms
36,000	53,534
99,334 Total Proposed	

20,149 therms net	conversion	
	1 therm =	0.1 MMBtu
	1000 kg =	1 MT
2014.943 MMBtu increase	1000000 g =	1 MT
106.9129 MT CO2/yr		
MT CH4/yr	natural gas combustion factors	
MT N2O/yr	53.06 kg CO2/MMBtu	
CO2E	1 g CH4/MMBtu	
	0.1 g N2O/MMBtu	

UC Davis CORE-2 Greenhouses Project: Electricity Estimate

Orchard Park

Total SF	Assume 75% Grow Area	Electricity Usage - HPS (kWh/yr)
53,250	39,937.5	7,207,996

Proposed - Cacao Germplasm Greenhouses

Total SF	Assume 75% Grow Area	Electricity Usage - LED (kWh/yr)
20,000	15,000.0	1,494,226

Proposed - Core 2 Greenhouses - Phase 1

Total SF	Assume 75% Grow Area	Electricity Usage - LED (kWh/yr)
10,800	8,100.0	806,882

Proposed - Core 2 Future Expansion

Total SF	Assume 75% Grow Area	Electricity Usage - LED (kWh/yr)
36,000	27,000.0	2,689,608
		4,990,716 Total Proposed
		-2,217,280 net

Electricity Factors based on the following calculator:

Utah State University Crop Physiology Laboratory Five-year cost calculator for plant lighting

Jacob A. Nelson and Bruce Bugbee

Version 1.0.2

For a discussion of the principles and economics of plant lighting , see our associated journal article [here](#).

Fixture 1

Fixture 2

Violet 400W, Lighting Science GrowAdvantage LED Grow Light		Standard 400W HPS w/ dimpled reflector and magnetic ballast	
Cost of fixture (\$)	\$1,200.00	Cost of fixture (\$)	\$200.00
Fixture efficiency ($\mu\text{mol}/\text{J}$)	1.70	Fixture efficiency ($\mu\text{mol}/\text{J}$)	0.94

PPF capture efficiency (%)	95%	Capture efficiency (%)	95%
Total fixture output ($\mu\text{mol}/\text{s}$)	653	Total fixture output ($\mu\text{mol}/\text{s}$)	416
Total fixture wattage (Watts)	384	Total fixture wattage (Watts)	443
Other Costs		Other Costs	
Maintenance cost over 5 years (\$)	\$0.00	Maintenance cost over 5 years (\$)	\$0.00
Installation cost (\$)	\$0.00	Installation cost (\$)	\$0.00
Canopy PPF capture efficiency (%)	90%	Canopy PPF capture efficiency (%)	90%

Operation Parameters

Growing area	10	m ²	
Desired PPF intensity ($\mu\text{mol}/\text{m}^2\cdot\text{s}$)	300		
Cooling factor (%)	25%		
Hours of light operation (hrs/yr)	4380	or	Photoperiod (hrs/day) 12.0
Electricity cost ($\$/\text{kW}\cdot\text{hr}$)	\$0.15	or	select state: California
			Electricity rate category: Commercial
			Cost of electricity: \$0.15
5 year average annual cost per square meter ($\\$/\text{yr}\cdot\text{m}^2$)	\$262	5 year average annual cost per square meter ($\\$/\text{yr}\cdot\text{m}^2$)	\$284

Facility Lighting Costs

Growing area	100	ft ²	
Violet 400W, Lighting Science GrowAdvantage LED Grow			Standard 400W HPS w/ dimpled reflector and magnetic
Number of fixtures needed	4.7		Number of fixtures needed 7.4
Initial price of fixture installation (\$)	\$5,692		Initial price of fixture installation (\$) \$1,488
5 year average annual electricity use for cooling (kWh/yr)	1,992		5 year average annual electricity use for cooling (kWh/yr) 3,610
5 year average annual electricity use for lighting (kWh/yr)	7,969		5 year average annual electricity use for lighting (kWh/yr) 14,439

Total 5 year average annual electricity use (kWh/yr)	9,962	Total 5 year average annual electricity use (kWh/yr)	18,048
5 year average annual electricity cost (\$/yr)	\$1,294	5 year average annual electricity cost (\$/yr)	\$2,344
5 year average annual cost (\$/yr)	\$2,432	5 year average annual cost (\$/yr)	\$2,642

Violet 400W, Lighting Science GrowAdvantage LED Grow Light is predicted to save \$126 per year for five years.

would be cost effective if:
 Electricity cost less than (\$/kW·hr) **-\$0.29**

Facility Infrastructure

Total fixture wattage (kW):	1.8	Total fixture wattage (kW):	3.3
Estimated required tons of refrigeration for lighting:	0.5	Estimated required tons of refrigeration for lighting:	0.9
Estimated capital cost of cooling system:	\$500	Estimated capital cost of cooling system:	\$900

UC Davis CORE-2 Greenhouses Project: Criteria Pollutant Emissions from Natural Gas Combustion for Existing Scenario

Natural Gas Combustion Criteria Air Pollutants:

Emission Calculation Assumptions:

No. of Units	1 boiler
Boiler Rating	
	0.9 MMBtu/hr (at 100% capacity factor)
Fuel Usage (per unit)	21.7 MMBtu/day (at 100% capacity factor)
	7,919 MMBtu/yr (at 100% capacity factor)
Heat Content of Gas	1,020 MMBtu/scf
Proposed	
Daily Load	100%
Annual Load	100%

Emission Factors:

Pollutant	Emission Factor	Emission Factor
	lb/10 ⁶ scf	lb/MMBtu
ROG	5.5	0.005
NOx	--	0.024
CO	98	0.096
SOx	0.6	0.001
PM ₁₀	7.6	0.007
PM _{2.5}	7.6	0.007

Reference:

CalEEMod 2016.3.1. To convert from lb/10⁶ scf, divide by 1,020

Emissions Calculations:

	Units	ROG	NOx	CO	SOx	PM ₁₀	PM _{2.5}
Emission Factor	lb/MMBtu	0.0054	0.024	0.096	0.0006	0.0075	0.0075
Estimated Emissions	Pounds/hour	0.005	0.022	0.087	0.001	0.007	0.007
	Pounds/day	0.117	0.521	2.084	0.013	0.162	0.162
	Pounds/year	42.698	190.044	760.797	4.658	59.001	59.001
	Tons/year	0.021	0.095	0.380	0.002	0.030	0.030

UC Davis CORE-2 Greenhouses Project: GHG Emissions from Natural Gas and Electricity for Existing Scenario

Natural Gas Combustion GHGs:

Operations Annual Natural Gas Use:

Existing 79,185 therms/year
7,919 MMBtu/year

conversion

1 therm = 0.1 MMBtu
1 kg = 2.20462 lb
1 g = 0.002205 lb

Indirect GHG gases	Emission Factor* lb/MMbtu	Annual		CO2 Equivalent Factor	Annual	
		Project Gas MMBtu	GHGs metric tons		CO2 Equivalent	Emissions (metric tons)
Carbon Dioxide (CO2)	116.9771	7,919	420.16	1	420.16	
Nitrous Oxide (N2O)	0.0002	7,919	0.0008	298	0.24	
Methane (CH4)	0.0022	7,919	0.0079	25	0.20	

natural gas combustion factors

53.06 kg CO2/MMBtu
1 g CH4/MMBtu
0.1 g N2O/MMBtu

Total Indirect GHG Emissions from Operations Electricity Use= 420.59

* Emission factors for CO2, CH4, and N2O are from EPA's Greenhouse Gas Inventory Guidance (2016)

Electricity Generation GHGs

Operations Annual Electrical Use:

Existing 7,208 MWh/year

Indirect GHG gases	Emission Factor* lb/MWh	Annual		CO2 Equivalent Factor	Annual	
		Project Electricity MWh	GHGs metric tons		CO2 Equivalent	Emissions (metric tons)
Carbon Dioxide (CO2)	559.32	7,208	1,828.69	1	1,828.69	
Nitrous Oxide (N2O)	0.0054	7,208	0.0177	298	5.26	
Methane (CH4)	0.0253	7,208	0.0827	25	2.07	

Total Indirect GHG Emissions from Operations Electricity Use= 1,836.02

* Emission factors for CO2, CH4, and N2O are from the CalEEMod software version 2016.3.1 for PG&E and adjusted based on 20% RPS by end of 2016

UC Davis CORE-2 Greenhouses Project: GHG Emissions from Water Conveyance for Existing Scenario

Water Electricity Conveyance GHGs

GHG Intensity Factors

GHG	Units	Year 2017
CO ₂	lb/MWh	559.32
CH ₄	lb/MWh	0.0253
N ₂ O	lb/MWh	0.0054

* Emission factors for CO₂, CH₄, and N₂O are from the CalEEMod software version 2016.3.1 for PG&E and adjusted based on 20% RPS by end of 2016

Electricity Intensity Factors

Process	Units	
Supply	kwh/MG	2,117
Treat	kwh/MG	111
Distribute	kwh/MG	1,272
Wastewater Treatment	kwh/MG	1,911
Total	kwh/MG	5,411

* Electricity intensity factors from CalEEMod Appendix D for YSAQMD.

Water Demand

Land Use	Growing Area Estimated (SF)	Indoor Water, gal/size/day	Indoor Water Use (gal/year)	Total Water Demand (gal/year)
Orchard Park Greenhouses	39,937.50	0.30	4,373,156.25	4,373,156.25
Total			4,373,156.25	4,373,156.25

* Water use estimate based on "general rule of thumb" from the UMass Extension (2009) - "Sizing the Greenhouse Water System" Available at: <https://ag.umass.edu/greenhouse-floriculture/fact-sheets/sizing-greenhouse-water-system>

GHG Emissions

	Units	Potable Water - Indoor	Total
Electricity Intensity Factor			
Supply	kwh/MG	2,117	N/A
Treat	kwh/MG	111	N/A
Distribute	kwh/MG	1,272	N/A
Wastewater Treatment	kwh/MG	1,911	N/A

	Total	kwh/MG	5,411	N/A
Water Consumption		MG/yr	4.4	4.4
Electricity Usage		kwh/yr	23,663	23,663
GHG Emissions - Year 2017				
CO ₂ E		metric tons/yr	6.03	6.03
CO ₂		metric tons/yr	6.00	6.00
CH ₄		metric tons/yr	0.0003	0.0003
N ₂ O		metric tons/yr	0.0001	0.0001

UC Davis CORE-2 Greenhouses Project: Criteria Pollutant Emissions from Natural Gas Combustion for Project Scenario

Natural Gas Combustion Criteria Air Pollutants:

Emission Calculation Assumptions:

No. of Units	1	boiler
Boiler Rating		
	1.1	MMBtu/hr (at 100% capacity factor)
Fuel Usage (per unit)	27.2	MMBtu/day (at 100% capacity factor)
	9,933	MMBtu/yr (at 100% capacity factor)
Heat Content of Gas Proposed	1,020	MMBtu/scf
Daily Load	100%	
Annual Load	100%	

Emission Factors:

Pollutant	Emission Factor lb/10 ⁶ scf	Emission Factor lb/MMBtu
ROG	5.5	0.005
NOx	--	0.024
CO	98	0.096
SOx	0.6	0.001
PM ₁₀	7.6	0.007
PM _{2.5}	7.6	0.007

Reference:

CalEEMod 2016.3.1. To convert from lb/10⁶ scf, divide by 1,020

Emissions Calculations:

	Units	ROG	NOx	CO	SOx	PM ₁₀	PM _{2.5}
Emission Factor	lb/MMBtu	0.0054	0.024	0.096	0.0006	0.0075	0.0075
Estimated Emissions	Pounds/hour	0.006	0.027	0.109	0.001	0.008	0.008
	Pounds/day	0.147	0.653	2.615	0.016	0.203	0.203
	Pounds/year	53.563	238.403	954.390	5.843	74.014	74.014
	Tons/year	0.027	0.119	0.477	0.003	0.037	0.037

UC Davis CORE-2 Greenhouses Project: GHG Emissions from Natural Gas and Electricity for Project Scenario

Natural Gas Combustion GHGs:

Operations Annual Natural Gas Use:

Proposed 99,334 therms/year
9,933 MMBtu/year

conversion

1 therm = 0.1 MMBtu
1 kg = 2.20462 lb
1 g = 0.002205 lb

Indirect GHG gases	Emission Factor* lb/MMbtu	Annual		CO2 Equivalent Factor	Annual	
		Project Gas MMBtu	GHGs metric tons		CO2 Equivalent Emissions (metric tons)	CO2 Equivalent Emissions (metric tons)
Carbon Dioxide (CO2)	116.9771	9,933	527.07	1	527.07	
Nitrous Oxide (N2O)	0.0002	9,933	0.0010	298	0.30	
Methane (CH4)	0.0022	9,933	0.0099	25	0.25	

natural gas combustion factors

53.06 kg CO2/MMBtu
1 g CH4/MMBtu
0.1 g N2O/MMBtu

Total Indirect GHG Emissions from Operations Electricity Use= 527.61

* Emission factors for CO2, CH4, and N2O are from EPA's Greenhouse Gas Inventory Guidance (2016)

Electricity Generation GHGs

Operations Annual Electrical Use:

Proposed 4,991 MWh/year

Indirect GHG gases	Emission Factor* lb/MWh	Annual		CO2 Equivalent Factor	Annual	
		Project Electricity MWh	GHGs metric tons		CO2 Equivalent Emissions (metric tons)	CO2 Equivalent Emissions (metric tons)
Carbon Dioxide (CO2)	499.66	4,991	1,131.11	1	1,131.11	
Nitrous Oxide (N2O)	0.0048	4,991	0.0109	298	3.24	
Methane (CH4)	0.0226	4,991	0.0511	25	1.28	

Total Indirect GHG Emissions from Operations Electricity Use= 1,135.63

* Emission factors for CO2, CH4, and N2O are from the CalEEMod software version 2016.3.1 for PG&E and adjusted based on 33% RPS by end of 2020

UC Davis CORE-2 Greenhouses Project: GHG Emissions from Water Conveyance for Project Scenario

Water Electricity Conveyance GHGs

GHG Intensity Factors

GHG	Units	Year 2028
CO ₂	lb/MWh	499.66
CH ₄	lb/MWh	0.0226
N ₂ O	lb/MWh	0.0048

* Emission factors for CO₂, CH₄, and N₂O are from the CalEEMod software version 2016.3.1 for PG&E and adjusted based on 20% RPS by end of 2016

Electricity Intensity Factors

Process	Units	
Supply	kwh/MG	2,117
Treat	kwh/MG	111
Distribute	kwh/MG	1,272
Wastewater Treatment	kwh/MG	1,911
Total	kwh/MG	5,411

* Electricity intensity factors from CalEEMod Appendix D for YSAQMD.

Water Demand

Land Use	Growing Area Estimated (SF)	Indoor Water, gal/size/day	Indoor Water Use (gal/year)	Total Water Demand (gal/year)
Orchard Park Greenhouses	50,100.00	0.30	5,485,950.00	5,485,950.00
Total			5,485,950.00	5,485,950.00

* Water use estimate based on "general rule of thumb" from the UMass Extension (2009) - "Sizing the Greenhouse Water System" Available at: <https://ag.umass.edu/greenhouse-floriculture/fact-sheets/sizing-greenhouse-water-system>

GHG Emissions

	Units	Potable Water - Indoor	Total
Electricity Intensity Factor			
Supply	kwh/MG	2,117	N/A
Treat	kwh/MG	111	N/A
Distribute	kwh/MG	1,272	N/A
Wastewater Treatment	kwh/MG	1,911	N/A

	Total	kwh/MG	5,411	N/A
Water Consumption		MG/yr	5.5	5.5
Electricity Usage		kwh/yr	29,684	29,684
GHG Emissions - Year 2028				
CO ₂ E		metric tons/yr	6.75	6.75
CO ₂		metric tons/yr	6.73	6.73
CH ₄		metric tons/yr	0.0003	0.0003
N ₂ O		metric tons/yr	0.0001	0.0001

APPENDIX C
NOISE MEMORANDUM

MEMORANDUM

To: Brian Grattidge, Senior Environmental Planner
From: Christopher Barnobi, Jonathan Leech, Dudek
Subject: Construction Noise Analysis for UC Davis Core 2 Phase 1 Greenhouses
Date: May 26, 2017
Attachment(s): Attachment A – Acoustic Definitions and Discussion; Sound and Vibration

This memo presents the results of a noise assessment for a University of California at Davis (UCD) proposed Core 2 Phase 1 Greenhouse demolition project (project). Project background information is contained in Section 1. A summary of noise policies included in the UCD Long Range Development Plan (LRDP) Environmental Impact Report (EIR) applicable to the proposed project are included in Section 2. Section 3 presents results from noise measurements conducted in the project vicinity. Construction noise is discussed in Section 4. Mitigation measures are included in Section 5. Appendix A presents a discussion of the fundamentals of environmental noise and vibration, for those who may not be familiar with acoustical terminology or concepts referenced in this assessment.

1 BACKGROUND

The project includes demolition of a collection of greenhouses and other building structures located on the University of California, Davis Campus. The project site is southeast of the intersection of Orchard Park Drive and Orchard Park Circle. The Baggins End Domes residential area is located across Orchard Park Drive from the project site. A student wellness center is located to the east of the project site. The La Rue Apartments are located on the other side of a small parking lot to the south of the project site. Other residential areas are located north of the project site across Orchard Road.

The nearest noise sensitive receivers are located to the west of the project site in the domes structures, approximately 75 feet from the project boundary. This closest noise sensitive receptor is approximately 390 feet from the center of the project site.

The project schedule is expected to extend over 5 years starting in 2017. Work will only occur for about 3 weeks during each year.

2 NOISE SIGNIFICANCE CRITERIA

UC Davis 2003 Long Range Development Plan (LRDP) Environmental Impact Report (EIR)

The UC Davis 2003 LRDP EIR includes Table 1 Thresholds of Significance for Noise Evaluations.

Table 1
Thresholds of Significance for Noise Evaluations

Noise Source ^a	Criterion Noise Level ^b	Substantial Increases in Noise Level ^b
Road Traffic and Other Long-Term Sources	65 dBA CNEL	>= 3 dBA if CNEL w/project is >= 65 dBA, >= 5 dBA if CNEL w/project is 50-64 dBA, >= 10 dBA if CNEL w/project is < 50 dBA
Construction (temporary)	80 dBA $L_{eq(8hr)}$ ^c daytime 80 dBA $L_{eq(8hr)}$ evening 70 dBA $L_{eq(8hr)}$ nighttime	Not Applicable

^a The 2003 LRDP would not substantially increase rail activity; therefore, a significance for rail noise is not included in this table.

^b At noise-sensitive land use unless otherwise noted. Noise-sensitive land uses include residential and institutional land uses.

^c $L_{eq(8hr)}$ is an average measurement over an eight-hour period.

The LRDP also states, “Although the University, as a state entity, is not subject to municipal regulations, local standards are a subject of importance to the University in evaluating impacts. It is University policy to seek consistency with local plans and policies where feasible.” The LRDP further summarizes the City of Davis Noise Element. It says:

Noise levels of less than 60 dBA CNEL are considered normally acceptable for residential, transient lodging (motels and hotels), schools, libraries, churches, and nursing home uses. Noise levels of 60 to 70 dBA CNEL are conditionally acceptable for residential, schools, libraries, churches, and nursing home uses, while noise levels of 60 to 75 dBA CNEL are considered conditionally acceptable for transient lodging.... For residences, schools, hospitals, and churches the [interior] standard is 45 dBA CNEL, and for offices the standard is 55 dBA L_{eq} .

Based on the criteria identified in Appendix G of the CEQA Guidelines, the proposed project would have a significant impact involving noise if it would result in:

1. The exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Memorandum

Subject: Noise Analysis for Core 2 Phase 1 Greenhouses

2. The exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.
3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

With respect to Significance Criteria #1 and the applicable noise policies and ordinances, a significant impact would occur if the project resulted in long-term (permanent) exterior noise exposure levels at vicinity residences greater than 65 dBA L_{dn} or CNEL. Since the proposed action consists only of the demolition of structures, the project would not have operational noise generation considered to be long-term. Therefore, this criterion does not apply to this project and is not evaluated in this memo. With respect to Significance Criteria #2, the project would not have the potential to generate long-term ground-borne vibration or noise. Over the short-term, the demolition efforts have the potential to expose nearby residences to excessive ground-borne vibration. The project is not expected to involve the principal sources for vibration generation and related complaints, which are pile driving and blasting. Therefore, project activities are not expected to be a source for substantial temporary ground-borne vibration.

With respect to Significance Criteria #3, L_{dn} increases of less than 3 dBA are acceptable when “with project” levels are greater than 65 dBA; a significant impact would occur with a greater than 5 dBA CNEL increase where ambient noise levels are between 50 and 64 dBA CNEL with project. For “with project” levels less than 50 dBA, a CNEL increase of up to 10 dBA is acceptable. In summary, if ambient noise levels are calculated to increase by less than 3 dBA as a result of the project, then the project would have a less than significant impact. This memo does not evaluate long-term operation that might be located at the proposed site, since new development it is not part of the project. Therefore, this criterion does not apply to this project and is not evaluated in this memo.

With respect to Significance Criteria #4, construction and demolition are the most common sources of temporary increases in the ambient noise levels caused by a proposed project. Table 1 shows that during normal working hours construction noise is limited to 80 dBA $L_{eq(8 \text{ hour})}$; daytime construction noise exceeding 80 dBA $L_{eq(8 \text{ hour})}$ would be considered a significant short-term noise impact. No substantial increase in ambient noise would occur if nighttime $L_{eq(8hr)}$ is calculated to stay below 70 dBA; if nighttime construction noise levels were to exceed 70 dBA $L_{eq(8hr)}$ a significant short-term noise impact would occur.

3 EXISTING CONDITIONS

Dudek visited the proposed project site on April 26, 2017 to measure ambient sound levels in the vicinity. Christopher Barnobi of Dudek conducted the sound level measurements. The school was in normal operations for the spring academic quarter (session). Students and pedestrians were seen walking and biking in the site vicinity during the measurements. Figure 1 shows the measurement locations marked on a site map.

Short-term (ST#) measurements were conducted with a Rion NL-62 sound level meter placed on a tripod with the microphone positioned approximately 5 feet above the ground. The short-term measurements were 5 minutes long. Table 2 presents the results of the short-term noise measurements.

Table 2
Short-Term Sound Level Measurements

Measurement	Distance to Roadway Edge	Observed Noise Sources	L _{eq} ¹	Cars
ST1	14 feet	Distant Traffic, Distant Train Horn, Birds, Wind/Tree Leaves, Pumps, Fans or other Mechanical Equipment from the Existing Greenhouses, People Talking, Bicyclists Riding By	53	6
ST2	7 feet	Distant Traffic, Nearby Traffic, Distant Backup Alarm, Wind/Tree Leaves, Distant Train Horn	51	1
ST3	7 feet	Distant Traffic, Children Playing, Wind/Tree Leaves, Distant Aircraft, Bicyclists	47	0
ST4	10 feet*	Parking Lot Aisle traffic, People talking, cars turning off/on, distant traffic, car doors closing @40 feet, distant aircraft, sawing	52	1

Notes:

- 1 Equivalent Continuous Sound Level (Time-Average Sound Level)
- * distance to centerline of parking lot aisle
- ** Temperature: 59° Fahrenheit, cloudy, 12 miles-per-hour light/gusty south wind

Short-term measured noise levels were below 55 dBA. These measurements include limited traffic (pedestrian, vehicular, and aircraft) but the majority of activity occurs at distances much greater than 100 feet in most cases.

The long term measurements were completed using two SoftDB Model Piccolo sound level meters. The Piccolo sound level meters meet the ANSI standard for a Type 2 general purpose sound level meter. The meters collected hourly measurements across a 24 hour period from midday Wednesday to Thursday. Those hourly equivalent levels (L_{eq}) were averaged together to produce the results

Memorandum

Subject: Noise Analysis for Core 2 Phase 1 Greenhouses

presented in Table 3. Eight (8) hour averages for the daytime, evening, and nighttime are presented as a reference of existing noise levels in the vicinity. The day is split into daytime (8a.m. to 4 p.m.), evening (4p.m. to midnight), and night (midnight to 8 a.m.).

Table 3
Long-Term Sound Level Measurements

		(dBA)			CNEL	Ldn
		Daytime Average Noise Levels 8a.m.-4p.m. <i>L_{eq(8hr)}</i>	Evening Average Noise Levels 4p.m.-12a.m. <i>L_{eq(8hr)}</i>	Nighttime Average Noise Levels 12a.m.- 8a.m. <i>L_{eq(8hr)}</i>		
LT1/ 7038	South of Project site, in Colleges at La Rue Apartment area near building 186	47	44	50	60	60
LT2/ 1014	Across Orchard Park Drive near the corner with Orchard Road near Domes	53	52	49	60	60

The measured CNELs are 5 dBA below the long term criteria of 65 dBA CNEL for road traffic and other long-term sources. The domes location (LT2) has levels that are 6-8 dBA higher than the La Rue Apartment location during daytime and evening hours. This is likely due to the position of the LT2 measurement location closer to the nearby roads compared to LT1 which was shielded from road noise by apartment buildings. Nighttime levels are similar for the locations. The daytime and evening measured levels are 33 to 36 dBA lower than the 80 dBA *L_{eq(8hr)}* limit for construction noise for LT1, and 27 dBA lower than the daytime/evening threshold of 80 dBA *L_{eq(8hr)}* for LT2. For nighttime, the measured levels were about 20 dBA lower than the 70 dBA *L_{eq(8hr)}* limit for construction noise.

4 CONSTRUCTION NOISE ASSESSMENT

This section discusses the noise levels from demolition of the existing buildings of the project, at nearby sensitive receptors using standard assumptions applicable to the construction fleet and activities generally associated with the demolition of these type structures. Demolition of structures occupying the project site would generate noise that could expose nearby receptors to elevated noise levels that may disrupt communication or routine activities. Noise generated by project-related demolition activities would be a function of:

Memorandum

Subject: Noise Analysis for Core 2 Phase 1 Greenhouses

- the noise levels generated by individual pieces of demolition equipment,
- the type and amount of demolition activity at any given time, the timing and duration of demolition activities,
- the proximity of nearby noise sensitive land uses,
- and the presence or lack of shielding at these sensitive land uses.

Noise levels would vary on a day-to-day basis during demolition, depending on the specific task being completed. Different phases of demolition might require a different combination of equipment necessary to complete the task and differing usage factors for such equipment. Noise would primarily result from demolition of the structures, operation of heavy equipment, and the arrival and departure of heavy-duty trucks. Construction equipment with substantially high noise-generation characteristics (such as pile drivers, rock drills, blasting equipment) would not be necessary for completion of the proposed demolition project.

Demolition noise is difficult to quantify because of the many variables involved, including the specific equipment types, size of equipment used, percentage of time, condition of each piece of equipment, and number of pieces of equipment that would actually operate on the site.

Table 4 summarizes noise levels for typical construction equipment that might be used for this project.

We expect the most common demolition equipment will be excavators (1-2) and/or bulldozers.

**Table 4
Equipment Noise Emission Reference Levels and Usage Factors**

<u>Equipment Description</u>	<u>Impact Device?</u>	<u>Acoustical Use Factor (%)</u>	<u>Spec 721.560 Lmax @ 50ft (dBA, slow)</u>	<u>Actual Measured Lmax @50ft (dBA, slow) samples averaged*</u>	<u>Number of Actual Data Samples (Count)</u>
All Other Equipment > 5 HP	No	50	85	-- N/A --	0
Concrete Saw	No	20	90	90	55
Dozer	No	40	85	82	55
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Jackhammer	Yes	20	85	89	133
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	212
Pickup Truck	No	40	55	75	1
Scraper	No	40	85	84	12
Warning Horn	No	5	85	84	12

Source: DOT 2006.

Memorandum

Subject: Noise Analysis for Core 2 Phase 1 Greenhouses

Noise levels generated by construction/demolition equipment (or by any point source outdoors) decrease at a rate of approximately 6 dBA per doubling of distance from the source. Therefore, if a particular construction activity generated average noise levels of 88 dBA at 50 feet, the L_{eq} would be 82 dBA at 100 feet, 76 dBA at 200 feet, 70 dBA at 400 feet, and so on. Intervening structures that block the line of sight, such as buildings, would further decrease the resultant noise level by a minimum of 5 dBA. Conversely, halving of the distance would add 6 dBA to the sound pressure levels; since the sound levels in Table 4 are based upon a reference distance of 50 feet, adding 6 dBA to the values for the sources listed in the Table 4 would represent their noise levels at 25 feet.

Some equipment used for demolition might violate the Davis Municipal code exemption listed in Article 24.02.040 of 83 dBA at 25 feet. This limit does not apply to impact tools, given that intake and exhaust mufflers recommended by the manufacturers and approved by the director of public works accomplish maximum noise attenuation.

Table 5 summarizes the distances to sensitive receptors used in the analysis of construction noise levels. The distances listed were measured from the project site boundary to the edge of the sensitive receiver locations using google earth tools.

Table 5
Distances to Receivers

Nearby Noise Sensitive Receiver	Distance from Site Boundary
Nearest Dome	65 feet
Russell Park Apartments	175 feet
The Colleges at La Rue	90 feet
Student Health and Wellness Center	50 feet

The closest noise sensitive receptors are the domes located immediately across Orchard Park Drive. The distance from boundary of the project site to the nearest dome is approximately 65 feet. According to the informational web-page (<http://schadavis.org/campus-housing/baggins-end-domes>), the domes are constructed out of fiberglass. It is possible that the construction of these domes provides less than the typical 25 dB of attenuation normally expected for residential construction in California.

We have assumed that up to two dozers and two excavators would be used simultaneously during construction. For the worst case scenario, one dozer and one excavator would be operating near the project boundary at approximately 65 feet from the nearest dome and the other

Memorandum

Subject: Noise Analysis for Core 2 Phase 1 Greenhouses

dozer and excavator would be operating on another nearby set of existing structures approximately 105 feet away from the nearest dome.

With this worst case scenario, a noise analysis was performed using a model developed under by the Federal Highway Administration (FHWA) called the Roadway Construction Noise Model (RCNM). This construction noise model includes representative sound levels (those shown in Table 4) for the most common types of construction equipment and the approximate usage factors of such equipment that were developed based on a database of information. The usage factors represent the percentage of time that the equipment would be operating at full power. Equipment anticipated during construction as described above were input into RCNM to calculate noise levels at the nearest sensitive receptors to the construction activities during each phase (FHWA RCNM User's Guide 2006).

Table 6 presents the summary results of the construction noise analysis.

Table 6
Worst Case Construction Noise at Receivers

Assumed Worst Case Construction Equipment and Distances to Nearest Receiver	Noise Level L_{eq} (dBA)
Dozer and Excavator at 65 feet And Dozer and Excavator at 105 feet	79.4

Temporary noise from construction would be clearly audible at the nearby sensitive receptors and could represent a substantial temporary increase over the existing ambient noise level.

The worst case scenario analyzed with RCNM is not expected to involve continuously produced noise during the full 8 hour daytime shift. Lower levels would be expected when demolition operations occur at areas further away from the domes. This increases the likelihood that actual construction noise levels will be even lower than the calculated 79.4 dBA. Therefore, the construction noise levels are expected to be less than 80 dBA $L_{eq(8hr)}$. Thus, the construction noise is expected to be less than the applicable significance threshold per the LRDP EIR daytime and evening construction noise criteria shown in Table 1.

While daytime construction noise levels were calculated to be less than significant, evening or nighttime construction activity could still result in nuisance. With lower ambient noise levels in the evening and at night, the construction noise would be more noticeable in these periods, and would also have a greater potential to be disruptive for residences in the project vicinity. Consequently, construction activity in the period between 10 PM and 7 AM would result in a

potentially significant short-term noise impact. This potentially significant impact would be avoided with adherence to required mitigation measures from the LRDP EIR (2003). Mitigation measures in the LRDP EIR (2003) that are applicable to the proposed project are presented in the following Section.

5 MITIGATION

The following mitigation measures from the UC Davis LRDP are required to be implemented during project demolition/construction in order to avoid the potential for significant noise impacts to occur in the evening and overnight periods, and to minimize the potential for adverse nuisance noise to occur during the daytime.

Short-Term Construction Mitigation Measures (Required)

The following mitigation measures are included in the LRDP EIR (2003) in order to address noise and vibration from construction activities, and must be incorporated into the proposed project:

- Construction equipment shall be properly outfitted and maintained with feasible noise-reduction devices to minimize construction-generated noise.
- Stationary noise sources such as generators or pumps shall be located 100 feet away from noise-sensitive land uses as feasible.
- Laydown and construction vehicles staging areas shall be located 100 feet away from noise-sensitive land uses as feasible.
- Whenever possible, academic, administrative, and residential areas that would be subject to construction noise shall be informed a week before the start of each construction project.
- Loud construction activity (i.e., construction activity such as jackhammering, concrete sawing, asphalt removal, and large-scale grading operations) within 100 feet of a residential or academic building shall not be scheduled during finals week.
- Loud construction activity as described above within 100 feet of an academic or residential use shall, to the extent feasible, be scheduled during holidays, Thanksgiving breaks, Christmas break, Spring break, or Summer break.
- Loud construction activity within 100 feet of a residential or academic building shall be restricted to occur between 7:30 AM and 7:30 PM.

Incorporation of the above mitigation measures, prescribed by the 2003 LRDP EIR, would reduce potentially significant temporary noise impacts associated with project demolition to less than significant.

Short-Term Construction Mitigation Measures (Recommended)

While not necessary to avoid or lessen a potentially significant temporary noise impact, the mitigation measures below are recommended in order to further minimize the potential for nuisance or annoyance from construction noise; these mitigation measures are recommended only (not mandatory):

- Construction site and access road speed limits should be established and enforced during the construction period.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, should be for safety warning purposes only.
- Equipment should not be left idling unless necessary.
- The project contractor should to the extent feasible, schedule construction activities to avoid the simultaneous operation of construction equipment so as to minimize noise levels resulting from operating several pieces of high noise level emitting equipment.
- Construction hours, allowable workdays, and the phone number of the job superintendent should be clearly posted at all construction entrances to allow surrounding property owners to contact the job superintendent if necessary. In the event the University receives a complaint, appropriate corrective actions should be implemented and a report of the action provided to the reporting party.

REFERENCES

Caltrans. 2013. Technical Noise Supplement. Caltrans (California Department of Transportation). September 2013. http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf

Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) User's Guide Final Report. 2006. http://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/rcnm.pdf

FHWA, Roadway Construction Noise Model (RCNM) (2008).

UC Davis 2003 LRDP Environmental Impact Report http://sustainability.ucdavis.edu/progress/commitment/environmental_review/lrdp_eir.html

DOT. 2006. *FHWA Roadway Construction Noise Model: User's Guide*. Final Report. FHWA-HEP-06-015. DOT-VNTSC-FHWA-06-02. Cambridge, Massachusetts: DOT, Research and Innovative Technology Administration. Final Report. August 2006.

ATTACHMENT A

*Acoustical Terms and Definitions
And
Sound and Vibration Background*

ATTACHMENT A

Acoustical Terms and Definitions And Sound and Vibration Background

ACOUSTIC TERMINOLOGY AND DEFINITIONS

Term	Definition
Ambient Noise Level	The normal or existing sounds pressure level of environmental noise at a given location. The composite of noise from all sources near and far.
Decibel	dB is the unit for measuring sound pressure level, equal to 10 times the logarithm to the base 10 of the ratio of the measured sound pressure squared to a reference pressure, which is 20 micro-Pascal.
A-Weighted Sound Level	dBA is the sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Community Noise Equivalent Level	CNEL is the A-weighted equivalent continuous sound exposure (CNEL) level for a 24-hour period with a ten dB adjustment added to sound levels occurring during nighttime hours (10 pm to 7 am) and a five dB adjustment added to the sound levels occurring during the evening hours (7 pm to 10 pm).
Day / Night Noise Equivalent Level	L_{dn} (or DNL) is the A-weighted equivalent continuous sound exposure level for a 24-hour period with a ten dB adjustment added to sound levels occurring during nighttime hours (10 pm to 7 am).
Equivalent Sound Level	L_{eq} is the sound level corresponding to a steady state sound level and containing the same total energy as a time varying signal over a given sample period.
Acoustic Center	For a source, the position where the propagating waves can be traced back to a single point of origin.

ATTACHMENT A (Continued)

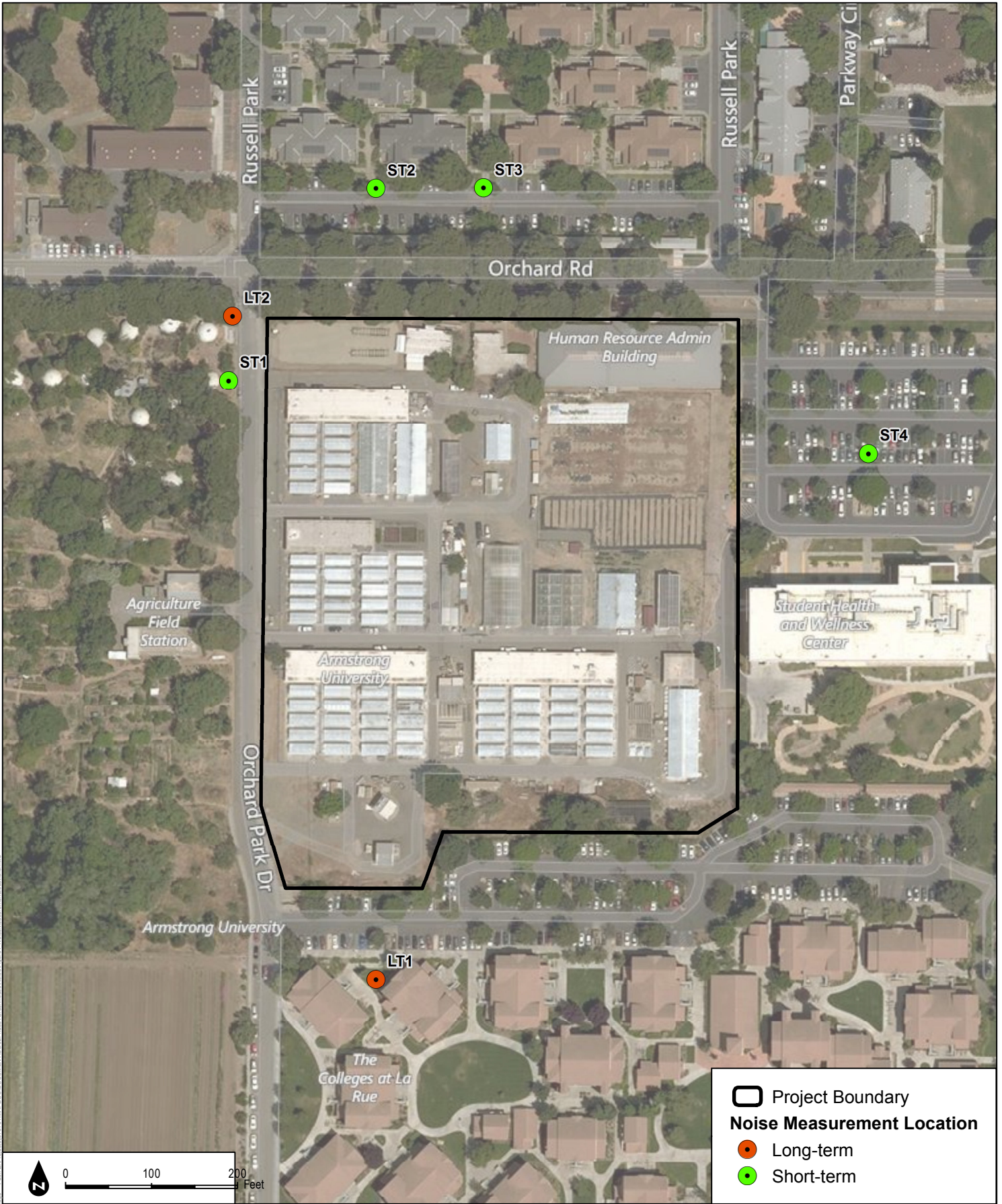
SOUND AND VIBRATION BACKGROUND

Vibrations, traveling as waves through air from a source, exert pressure perceived by the human ear as sound. Sound pressure level (referred to as sound level) is measured on a logarithmic scale in decibels (dB) that represent the fluctuation of air pressure above and below atmospheric pressure. Frequency, or pitch, is a physical characteristic of sound and is expressed in units of cycles per second or hertz (Hz). The normal frequency range of hearing for most people extends from about 20 to 20,000 Hz. The human ear is more sensitive to middle and high frequencies (about 1,000 to 4,000 Hz), especially when background noise levels are lower. As noise levels get louder, the human ear starts to hear the frequency spectrum more evenly. To accommodate for this phenomenon, a weighting system to evaluate how loud a noise level is to a human was developed. The frequency weighting called “A” weighting is typically used for quieter noise levels which de-emphasizes the low frequency components of the sound in a manner similar to the response of a human ear. A-weighted sound level is referenced with units of dBA.

“It is generally accepted that the average healthy ear...can barely perceive a noise level change of 3 dB” (Caltrans 2013). A change of 5 dBA is readily perceptible, and a change of 10 dBA is perceived as twice or half as loud. A doubling of sound energy results in a 3 dBA increase in sound, which means that a doubling of sound energy (e.g., doubling the average daily numbers of traffic on a road) would result in a barely perceptible change in sound level.

An individual’s noise exposure occurs over a period of time; however, instantaneous noise level is a measure of noise at a given instant in time. The equivalent noise level L_{eq} , also referred to as the average sound level, is a single-number representing the fluctuating sound level in decibels (dB) over a specified period of time. It is a sound-energy average of the fluctuating level and is equal to a constant unchanging sound of that dB level. Community noise sources vary. Often a relatively stable background or ambient noise environment can still be assessed based on long term measurements.

Noise levels are generally higher during the daytime and early evening when traffic (including airplanes), commercial, and industrial activity is the greatest. However, noise sources experienced during nighttime hours when background levels are generally lower can be potentially more conspicuous and irritating to the receiver. In order to evaluate noise in a way that considers periodic fluctuations experienced throughout the day and night, a concept termed “community noise equivalent level” (CNEL) was developed. The CNEL scale represents a time-weighted 24-hour average noise level based on the A-weighted sound level. CNEL accounts for the increased noise sensitivity during the evening hours (7 p.m. to 10 p.m.) and nighttime hours (10 p.m. to 7 a.m.) by adding five dB to the average sound levels occurring during the evening hours and 10 dB to the sound levels occurring during nighttime hours. The Day-Night Level (L_{dn}) is a similar metric without the five dB penalty during evening hours included.






-  Project Boundary
- Noise Measurement Location**
-  Long-term
-  Short-term

FIGURE 1
Noise Measurement Locations

SOURCE: Bing Maps (Accessed 2017)



UC Davis Core 2 Phase 1 Greenhouse Project

018 - 510017 - List saved by arbdobson - Path: Z:\projects\071011\MAP\DOCUMENT\Core2Phase1\Greenhouse\Noise\Figure 1 - NoiseMeasurementLocations.mxd

