STUDENT HOUSING WEST PROJECT

Draft Environmental Impact Report

Volume II

SCH No. 2017092007

Prepared for:

Physical Planning, Development & Operations
Physical & Environmental Planning Services
University of California Santa Cruz
1156 High Street, Barn G
Santa Cruz, CA 95064

Prepared by:

Impact Sciences, Inc.
505 14th Street, Suite 1230
Oakland, California 94612
(510) 267-0494

March 2018

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First and Second Notice of Preparation, Comments, and Transcripts

FIRST NOP (AUGUST 2017)

Notice of Preparation

To: State Clearinghouse
P.O Box 3044
Sacramento, CA 95812-3044
(Address)

From: UC Santa Cruz, PP&C
1156 High Street
Santa Cruz, CA 95064
(Address)

Subject: Notice of Preparation of a Draft Environmental Impact Report

The University of California will be the Lead Agency and will prepare an environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and the potential environmental effects are contained in the attached materials. A copy of the Initial Study (☐ is ☒ is not) attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please send your response to Alisa Klaus, Sr. Environmental Planner at the address shown above. We will need the name for a contact person in your agency.

Project Title: Student Housing West

Project Applicant, if any:

Date August 31, 2017

Signature Alisa Klaus

Title Senior Environmental Planner

Telephone 831-459-2170

Reference: California Code of Regulations, Title 14, (CEQA Guidelines) Sections 15082(a), 15103, 15375.

UNIVERSITY OF CALIFORNIA, SANTA CRUZ

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO SANTA BARBARA • SANTA CRUZ

PHYSICAL PLANNING AND CONSTRUCTION SANTA CRUZ, CALIFORNIA 95064

August 31, 2017
State of California
Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814

REVISED NOTICE OF PREPARATION: DRAFT ENVIRONMENTAL IMPACT REPORT

Lead Agency: University of California

Project Title: Student Housing West Project

Project Location: UC Santa Cruz main campus, Santa Cruz (Exhibit 1)

County: Santa Cruz

The University of California will be the Lead Agency and will prepare an Environmental Impact Report ("EIR") for the project described below.

On April 10, 2017, the University of California, Santa Cruz Campus (UC Santa Cruz) issued a Notice of Preparation (NOP) for an EIR focused on an amendment to the UC Santa Cruz 2005 Long Range Development Plan ("2005 LRDP") to support the future development of student housing in the western portion of the UC Santa Cruz main campus. The NOP was issued in accordance with the State CEQA Guidelines (14 California Code of Regulations [CCR] Section 15082) with the intent of informing agencies and interested parties that an EIR would be prepared for an amendment to the 2005 LRDP land use map that would support the future development of a 3,000-bed student housing project on the campus. As was noted in that NOP, that EIR was planned to be a Subsequent EIR (SEIR) to the previously certified UC Santa Cruz 2005 Long Range Development Plan EIR (SCH #2005012113) and was expected to evaluate and disclose the programmatic impacts that could result from the approval of the proposed LRDP amendment.

Since the release of the original NOP, UC Santa Cruz has advanced the planning for the student housing project and has determined that adequate information is now available to evaluate the 3,000-bed student housing project for its specific impacts. This revised NOP is for a project-level EIR that will evaluate and disclose the environmental impacts from the construction and operation of the Student Housing West project. As the construction of the student housing project may require a minor land use amendment, the EIR will also address the environmental impacts from amending the 2005 LRDP. In addition, the EIR will include updated water supply and population and housing analyses for the 2005 LRDP, and a new greenhouse gas emissions impact analysis for the 2005 LRDP.

Proposed Project: The proposed Student Housing West project to be analyzed in the project-level EIR includes the construction and occupancy of up to 3,000 new beds of student housing for upper division undergraduate students, graduate students and students with families, including support spaces, amenities and associated infrastructure. The project is envisioned to be constructed in phases, with at least 900 beds to be available by July 31, 2020 and the remainder of the project to be completed by July 31, 2022.

Implementation of the student housing project may require an amendment to the 2005 LRDP land use map (Exhibit 2). The proposed LRDP amendment will revise the land use designation of less than 5 acres of land on the West Campus from Campus Resource Land (CRL) to Colleges and Student Housing (CSH) (compared to the 14-acre land use amendment described in the April 2017 NOP).

The proposed project supports the UC system-wide Housing Initiative, which was announced by UC President Janet Napolitano in January 2016. The overarching goals of the housing initiative are two-fold: first, to ensure that each of UC's campuses has sufficient housing for its growing student populace; and second, to keep housing as affordable as possible for UC students.

Background: The 2005 LRDP, which was approved by the UC Regents in September 2006, provides a comprehensive framework for the physical development of the UC Santa Cruz campus, to accommodate an on-campus 3-quarter-average enrollment of 19,500 students, or an increase of approximately 5,100 students from the 2003-04 baseline.

The 2005 LRDP includes a building program to accommodate UCSC's academic, research, and public service mission as enrollment grows, and a land use plan that assigns elements of the building program to designated land-use areas and describes general objectives that will guide development within those areas. The building program identifies a total of about 3,175,000 gross square feet of building space, including 1,196,000 gross square feet of student and employee housing.

The land use plan assigns the land use designation Colleges and Student Housing (CSH) to 288 acres of land to the east, north, and west of the academic core. This land use designation accommodates the construction of new colleges, expansion of existing colleges through infill, new undergraduate and graduate student housing, and family student housing projects.

The 2005 LRDP identifies on-campus housing targets of 50 percent of undergraduate students and 25 percent of graduate students. Thus, the 2005 LRDP EIR evaluated the addition of 2,300 student beds to the inventory of 6,891 beds existing in fall 2004, for a total of 9,190 beds.

As part of a 2008 Comprehensive Settlement Agreement that resolved lawsuits by the City and County of Santa Cruz and nine citizens, the University agreed that UC Santa Cruz will provide housing to accommodate 67 percent of new-student enrollment within four years of reaching that enrollment. At a total enrollment of 19,500, UCSC would need to have university housing available for 10,125 students, which would be 935 more beds than analyzed in the 2005 LRDP EIR. In addition, as part of the Settlement Agreement, the University agreed that housing development in the area west of Porter College will be initiated before development of new bed spaces in the North Campus area.

The Student Housing West Project would construct up to 3,000 student beds on the West Campus in phases, with at least 900 beds to be available by July 31, 2020 and the remainder of the project to be completed by July 31, 2022. These new beds would enable the Campus to eliminate some overflow beds in existing housing, and to meet its commitments under the Settlement Agreement.

Environmental Review and Comment: The EIR for the Student Housing West project will be a project-level EIR focused on the environmental impacts from the construction and operation of the proposed project. As appropriate, the analysis will be tiered from the analyses contained in the previously certified UC Santa Cruz 2005 Long Range Development Plan EIR (SCH #2005012113). The EIR will address all of the issues identified in Appendix G to the CEQA Guidelines, that is: aesthetics, agricultural and forestry resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, utilities and service systems. As a project-level EIR tiered from the 2005 LRDP EIR, the EIR will rely on the cumulative impact analysis contained in the 2005 LRDP EIR. However, because the Santa Cruz Superior Court determined the 2005 LRDP EIR's analysis of water supply and population and housing impacts to be inadequate and directed the University to supplement those analyses, the Student Housing West Project EIR will include a supplement to the 2005 LRDP EIR that will provide an updated analysis of the cumulative impacts of campus growth under the 2005 LRDP on water supply, and population and housing. It will also include an analysis of impacts related to greenhouse gas emissions that would potentially result from the remaining campus development under the 2005 LRDP.

In compliance with the State and University of California guidelines for implementation of CEQA, this NOP is hereby sent to inform you that UC Santa Cruz is preparing a Draft EIR for the above-named project. As Lead Agency we need to know the views of you or your agency as to the scope and content of the environmental information that is germane to you or your agency's statutory responsibilities, if any, in connection with the proposed project.

UC Santa Cruz requests input regarding the scope and content of the Draft EIR that is relevant to you or your agency's statutory/regulatory responsibilities or is of interest to interested individuals, to ascertain potential environmental impacts of the project. Responses to this NOP are requested to identify: 1) the significant environmental issues, reasonable alternatives, and mitigation measures that should be explored in the Draft EIR; and 2) whether your agency will be a responsible or trustee agency for the project.

We appreciate your prompt acknowledgement and review of this NOP. Due to the time limits mandated by state law, your response must be sent at the earliest possible date, but not later than 30 days after receipt of this notice.

COMMENT PERIOD: Written comments on the NOP can be sent anytime during the NOP review period which begins September 1, 2017 and ends October 2, 2017 at 5:00 PM. Please send your written or electronic responses, with appropriate contact information, to the following address:

Alisa Klaus
Senior Environmental Planner
Physical Planning and Construction
University of California, Santa Cruz
1156 High Street
Santa Cruz, CA 95064

eircomment@ucsc.edu

INFORMATION AND SCOPING SESSION: Written comments on the NOP may also be provided at the information and scoping session to be held on Thursday, September 28, 2017, from 7:00 PM to 8:00 PM at the Louden Nelson Community Center at 301 Center Street in downtown Santa Cruz.

If you have any questions regarding the NOP or the information and scoping session please contact Alisa Klaus, Senior Environmental Planner, at (831) 459-3732.

2839290.2

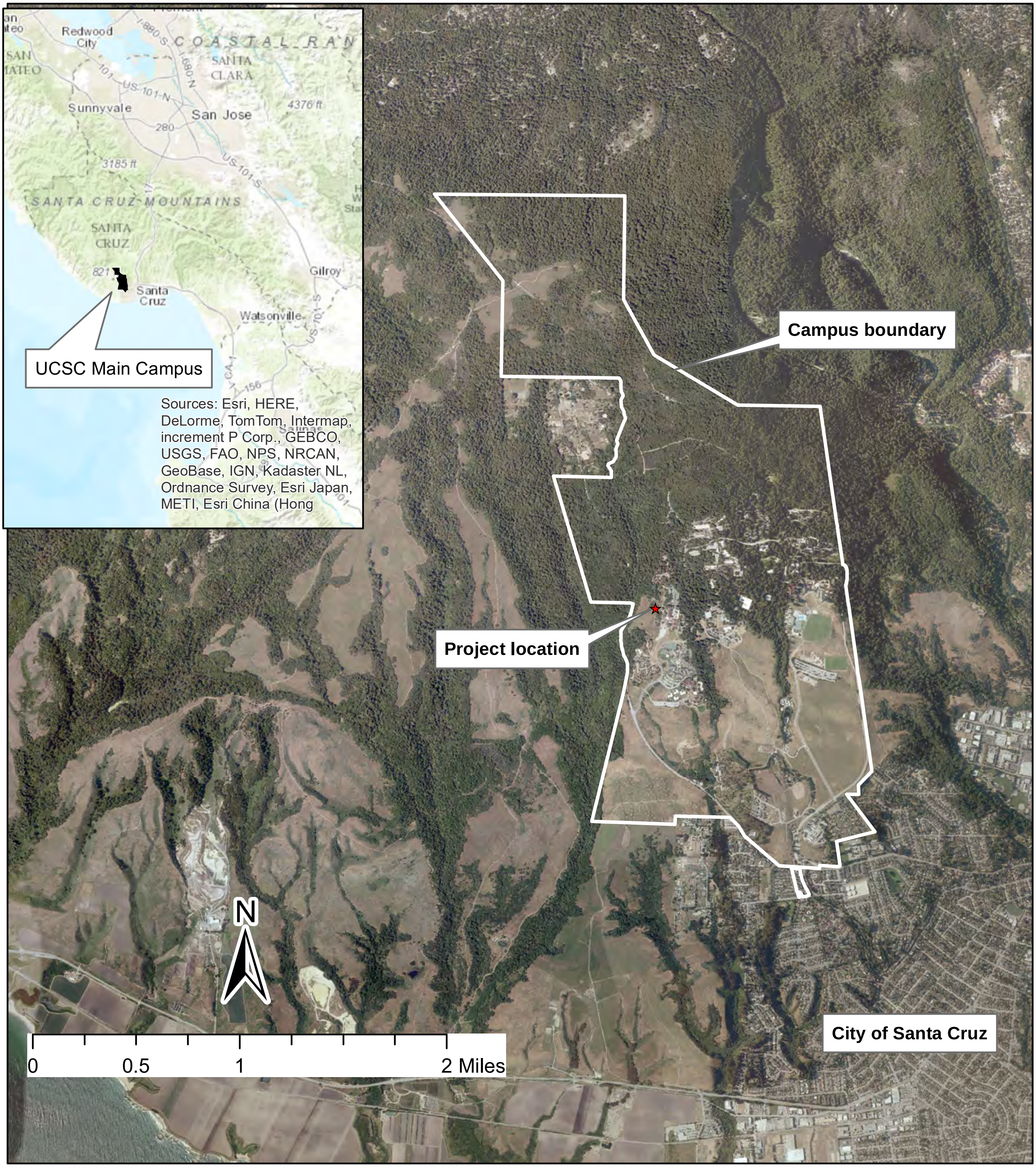

Exhibit 1: Project Location

Student Housing West Project
EIR Notice of Preparation
August 2017

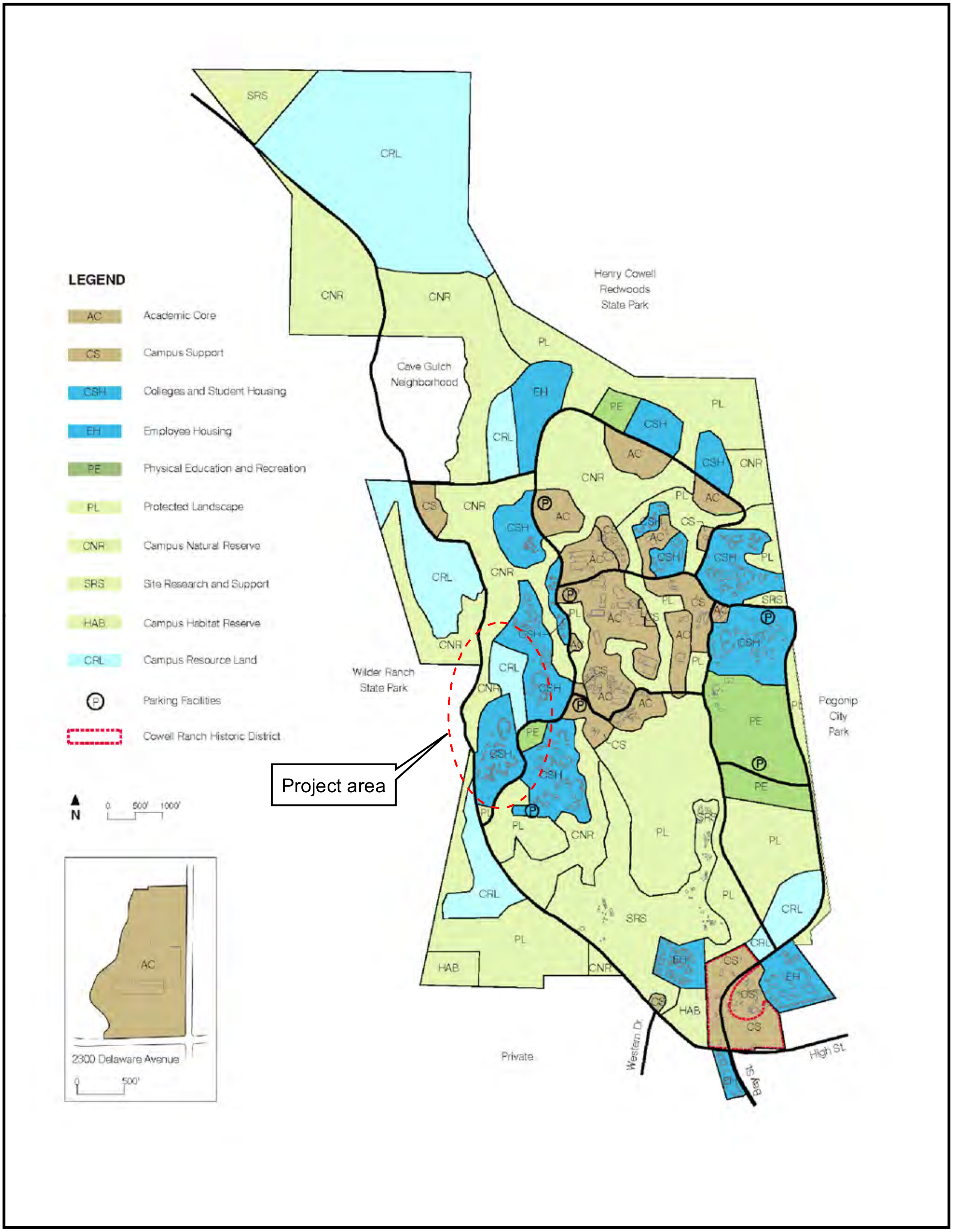

Exhibit 2: Project Area

Student Housing West
EIR Notice of Preparation
August 2017

COMMENTS

DEPARTMENT OF TRANSPORTATION
50 HIGUERA STREET
SAN LUIS OBISPO, CA 93401-5415
PHONE (805) 549-3101
FAX (805) 549-3329
TTY 711
http://www.dot.ca.gov/dist05/

Making Conservation a California Way of Life.

October 2, 2017

SCrz 1 20.09
SCH#2017092007

Alisa Klaus, Senior Environmental Planner
Physical Planning and Construction
University of California, Santa Cruz
1156 High St.
Santa Cruz, CA 95064

COMMENTS FOR REVISED NOTICE OF PREPARATION (NOP) FOR THE STUDENT HOUSING WEST PROJECT DRAFT ENVIRONMENTAL IMPACT REPORT (DEIR)

Dear Ms. Klaus:

The California Department of Transportation (Caltrans), District 5, Development Review, has reviewed the above referenced project and offers the following comments.

1. Caltrans supports local planning efforts that are consistent with State planning priorities intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety. We accomplish this by working with local jurisdictions to achieve a shared vision of how the transportation system should and can accommodate interregional and local travel.

2. Projects that support smart growth principles which include improvements to pedestrian, bicycle, and transit infrastructure (or other key Transportation Demand Strategies) are supported by Caltrans and are consistent with our mission, vision, and goals.

3. The traffic study should include information on existing traffic volumes within the study area, including the State transportation system, and should be based on recent traffic volumes less than two years old. Counts older than two years cannot be used as a baseline.

4. At any time during the environmental review and approval process, Caltrans retains the statutory right to request a formal scoping meeting to resolve any issues of concern. Such formal scoping meeting requests are allowed per the provisions of the California Public Resources Code Section 21083.9 [a] [1].

Thank you for the opportunity to review and comment on the proposed project. If you have any questions, or need further clarification on items discussed above, please contact me at (805) 549-3432 or Jenna.Schudson@dot.ca.gov.

Sincerely,

Jenna Schudson
Transportation Planner
Development Review Coordinator
District 5, LD-IGR South Branch

Google @ UCSC

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] EIR Scoping period for Student Housing West

1 message

Angela <yoangie@msn.com> Mon, Oct 2, 2017 at 2:52 PM
To: "eircomment@ucsc.edu" <eircomment@ucsc.edu>

Hello,

Below are the comments I would like to submit regarding the Student Housing West EIR Scoping period:

1. If there are 4 acres of suitable land for California Red Legged Frog, those absolutely need to be protected from development.

2. Since some of the soil is suitable for Ohlone Tiger Beetles, this habitat should be set aside for them. Neither buildings nor pathways should be set over these soils.

3. Calochortus luteus, or yellow mariposa lily, has been observed in the proposed development site. This is an endemic species and its habitat should be marked so that it can be protected.

4. ALL plant, bat and bird species present need to be catalogued and researched as far as current population counts, diminishing nature of their historic ranges, and in order to establish baseline population data.

It is imperative that detection and monitoring take place in known and suspected historic ranges of all native plant and animal species to ensure future development decisions do not detrimentally impact the species.

We must find a way not to cause local extinctions of any native species.

5. Noise and runoff from construction also need to be projected, measured, and its impact assessed for sensitive animal (invertebrate and vertebrate) species. If noise would have a negative impact on these populations, it is irresponsible to build at the proposed site and alternatives should be explored.
This sentence from the RFQ is absolutely ludicrous: "The proposed project is not expected to result in significant operational noise and is not

located in the vicinity of noise sources which would be incompatible with the proposed residential use. "

6. Observation by a team of qualified biologists needs to be done over an extended seasons in order to observe the temporal fluctuations in habitat usage and water patterns. Multiple people need to be spending extended time at the site over different periods of day and night.

7. Regarding cultural resources, the Amah Mutsun Tribal Band should be consulted. I don't think anyone else is better qualified to say that there aren't significant cultural resources besides the historic stewards and caretakers of this land.

8. Consultant should observe how water flows through this area, and what areas are important not to block or locate buildings over in order to avoid blocking water from being infiltrated naturally.
What might be done to protect the way the watershed is laid out on and below the surface? It should probably be observed during rain for this!

All in all this is a pretty incredible natural site to build over so I hope to see an outstanding EIR. Better than basic. This scope of this should be so throughtful that it takes EIRs to the next level.

--
Angela Harris
UCSC Alumna

17 September 2017

Alisa Klaus
Senior Environmental Planner
Physical Planning and
Construction University of
California, Santa Cruz 1156
High St.
Santa Cruz, CA 95064

Dear Alisa,

Thank you for the opportunity to work with you on this. I am writing as Manager of the UCSC Campus Natural Reserve (CNR) with comments regarding the Revised Notice of Preparation: Draft Environmental Impact Report (EIR) for the potential Long Range Development Plan (LRDP) land use redesignation of less than 5 acres of land from Campus Resource Land to Colleges and Student Housing and the associated Core West Housing Project. As CNR land lies adjacent to the proposed redesignation and project area, I am writing with the following comments pertaining to potential impacts to the CNR that I hope will be addressed within the scope and content of the forthcoming EIR.

1. The proposed redesignation area is adjacent to CNR lands that are frequently used for course field trips, a use that is core to the mission of UC Santa Cruz and the CNR: supporting teaching, research, and stewardship. Courses using these areas include EART 5, ENVS 15, ENVS 100, ENVS 167, KRSG 64, KRSG 161, PRTR 25, PRTR 47S, SCIC 106A, and SOCY 125. As is seen in other natural lands areas adjacent to student housing, there are frequent disturbances associated with recreation that have direct impacts on flora and fauna and the potential for teaching and research. Colleges 9/10 provide a prime example---there are numerous ad-hoc paths on steep, eroding slopes within the adjacent ravine, as well as fire pits and several stick fort party sites that accumulate significant amounts of trash within the watershed.

- Mitigation measures could include mandatory stewardship training (online or in person) designed to bring awareness to sensitive environmental features and ways to reduce impacts to these resources. Campus Natural Reserve staff would be willing to participate in the development of such training materials. Further mitigation measures could include interpretive signage related to sensitive species and habitats, signs communicating best stewardship/Leave No Trace principles for lessening impact on the environment, and signs throughout the area that provide an overview of the CNR lands and mission.

2. Several rare and endemic invertebrate species have been identified in Empire Cave, a karst formation along the Cave Gulch stream just west of Porter Meadow. These species include the Santa Cruz Telemid spider (*Telemid* sp.); *Meta dolloff; Stygobromus mackenziei*, an amphipod; and *Fissilicreagris imperialis*, a pseudoscorpion. In a 2002 report of the cave's biological diversity, Dr. Darrell Ubick of the California Academy of Sciences lists several ongoing impacts from human use of the cave, including well-intentioned cave clean-ups that remove important habitat (wood, other natural debris) and introduction of chemicals via smoke, campfires, and spray paint, as a threat to these rare organisms and their habitat. Increased density of students living in close proximity will likely increase potential impacts to the cave and associated fauna. Since blocking off the cave entrance poses an even more drastic threat to the cave organisms, mitigation measures could dovetail with those listed above in #1.

- Current mitigation includes installation and maintenance of an interpretive sign by the cave entrance, which is currently maintained by CNR staff. Proximity to Empire Grade and parking areas makes management difficult, as the cave is very visible and accessible.

3. I have found adult California giant salamander (*Dicamptodon ensatus*) within the CNR's forested edges by the southern portion of Porter Meadow on two occasions within the last four years. It breeds

in Cave Gulch stream, within the CNR, where larva can be found year-round. The California Department of Fish and Wildlife designates this species as a Species of Special Concern. Although dispersal distance of the terrestrial form of this species is unknown in our region, members of this species have been shown to migrate several hundred meters from aquatic habitat. The impacts of development on this species should be considered in the EIR.

4. Management of stormwater runoff from project development sites (including construction and staging areas, as well as the completed development) and associated erosion potential should be incorporated into the EIR.

5. Outdoor lighting can have an effect on animal behavior. The new housing development will no doubt have outdoor lighting for safety and general use. Analysis of the development's lighting design should be incorporated into the EIR. I suggest that outdoor lighting be eliminated on the outer, wildland-facing edges of the development, and if necessary, dimmer lights, the use of motion sensors, and late night off-periods are recommended strategies to minimize the intensity of impact that the lights may have on the surrounding habitats.

6. Construction and staging areas will be disturbed and will need restoration. Restoration of these areas should be done with native species from local seed sources. Additionally, establishment of invasive plant species is a concern for adjacent CNR lands, as well as other-designated natural areas near the project site. Though Porter Meadow and other adjacent CNR lands host several species of invasive plant, the grassland also hosts large stands of native California oatgrass (*Danthonia californica*) and purple needlegrass (*Stipa pulchra*), and is home to native forbs such as sky lupine (*Lupinus nanus*) and yellow mariposa lily (*Calochortus luteus*).

- Mitigation measures could include, but not be limited to, the following:
    - Surveying for invasive species in construction and staging areas pre and post project construction
    - Rumble-strips to reduce transport of seeds within soil on truck tires
    - Revegetating construction and staging areas with native plants from local sources
    - Landscaping the new housing development with native plants from local sources
    - Pre and post photo documentation of sites
    - Specific language pertaining to continued weed abetment if invasive species are introduced to the site.

CNR staff and students would be willing to help with invasive species monitoring, removal, and restoration efforts within nearby CNR lands.

I ask that these potential impacts on the Campus Natural Reserve of the proposed West Campus Housing projects and the redesignation of LRDP land use be included within the scope and content of the upcoming EIR. I would be happy to assist with creating education-related mitigation measures and guidance for restoration/revegetation mitigation efforts.

Respectfully,

Alex Jones

Alex Jones
UCSC Campus Natural Reserve Manager
1156 High St
Santa Cruz, CA
95064
831.459.4971
asjones@ucsc.edu

I feel hopeless... There's really no future for ~~these~~ the present generation & generations beyond...

Please have UC fund & stock more & more bus - vans.

UC Santa Cruz 2005 LRDP
Student Housing West Project
DRAFT EIR, SCOPING MEETING
(September 28, 2017)

* I wish the UCSC ~~[illegible]~~ still had 4 or 5 campuses only!!

Written scoping comments may be submitted tonight by placing them in the labeled box at the back of the room, or throughout the public review period, by mail to: Alisa Klaus, UC Santa Cruz, Physical Planning & Construction, 1156 High St., Santa Cruz, CA 95064, or via email to eircomment@ucsc.edu. The scoping period closes on October 2, 2017, at 5:00 PM.

Commenter name: (PLEASE PRINT) Ms. Alene Smith, active citizen since 1969!

Comments: I've come to believe we're living a science-fiction-horror-story which regretfully has become sheer reality! Does the UC system actually wish & want there to be a surge of higher-higher-pop. of students?? Who the Hell can afford it?? Yes, yes, grant & scholarships, etc. Fact: B.A. degrees, alone, have been useless for last 40 years!! Can you house the wage-slaves?? Domestic, & janitorial, & cafeteria & clerk positions? What about crucial source: WATER?? Drought, drought, drought!! Even most Ph.D. degrees (over) have become useless! Why?? For every professorship at a College throughout this entire nation — 80-100 applicants!! It took my brother-in-law w/a Science Ph.D. forever to secure a position in 1980's! He was rejected countless times, until Uncle Sam - military hired him, yet he quit when officials wanted him to make genocidal - war - chemicals! He applied to 4 medical Schools & accepted the first of all 4 which accepted him & he became a G.P./medical doctor. I know countless men & women w/B.A., M.A., Ph.d degrees & no occupations in their study-field. However... Am glad to've read news of the 3,000 rooms to be built for said, reported, students. — In the long run, there are simply too many damn humans on this planet! Find another planet?? Can only hope, wish for, as much as this planet is being utterly destroyed, demolished, extinguished, burned-up & non-existant...

I hope to reincarnate to a more loving, evolved planet...!

UC Santa Cruz 2005 LRDP
Student Housing West Project
DRAFT EIR, SCOPING MEETING
(September 28, 2017)

Written scoping comments may be submitted tonight by placing them in the labeled box at the back of the room, or throughout the public review period, by mail to: Alisa Klaus, UC Santa Cruz, Physical Planning & Construction, 1156 High St., Santa Cruz, CA 95064, or via email to eircomment@ucsc.edu. The scoping period closes on October 2, 2017, at 5:00 PM.

Commenter name: (PLEASE PRINT) Angela Harris

Comments: To Study hydrology and wildlife and plant species present, Study needs to be conducted over various seasons. EIR's Impact Sciences should also consult w/ Amah Mutsun Tribal Band. Impact Sciences should find a way to Study & measure the impact of construction noise on wildlife. Please also Study 4 acres at Southern end of site for Red-legged frog. Having a draft EIR by January does not allow for Study of wildlife migration patterns.

Re: → Cultural Resources

Alisa Klaus <aklaus@ucsc.edu>

Re: Student Housing West project

1 message

Bruce Rogers <bwrogers@dslextreme.com> Tue, Sep 19, 2017 at 5:14 PM
To: Alisa Klaus <aklaus@ucsc.edu>
Cc: Sue Matthews <sdmatthe@ucsc.edu>

Alisa,

Yes, I have a copy of the NOP, but thank you for sending an additional pdf.

As I mentioned, there may be some serious concerns about siting buildings and infrastructure in the Porter Meadow area. In the past, building sites on the campus have ignored some aspects of the geology and now the campus is paying the price of having to remove some of those buildings at great cost and somehow replace them with newer buildings . . . hopefully not in the same problem area.

Is there any interest in obtaining additional input into the draft EIR from knowledgeable persons or is the EIR material strictly from staff and consultants hired by staff? It seems that adding additional material to the draft may lessen the load of attempting to address possible problems after the draft EIR has been released.

Yours,
Bruce Rogers
USGS (ret.)
President, Western Cave Conservancy

==

On Sep 19, 2017, at 4:04 PM, Alisa Klaus <aklaus@ucsc.edu> wrote:

> Hello, Bruce--The document that is being circulated for public review is the notice of preparation (attached) for the Draft Environmental Impact Report (EIR). The purpose of this notice is to solicit comments from the public and agencies on the analysis that should be included in the EIR. The Draft EIR itself has not been completed.
>
> Alisa Klaus
> Senior Environmental Planner
> UCSC Physical Planning and Construction
> (831) 459-3732

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Student Housing West

1 message

Claire Castagna <castagna.claire@gmail.com> Sat, Sep 16, 2017 at 2:03 PM
To: eircomment@ucsc.edu

Thank you for soliciting input from the public on the addition of 3000 beds at UCSC. We have lived on the westside for over 30 years and have raised our children here. Since they are now young adults who need to rent and would like to purchase homes--we are acutely aware of the housing shortage in Santa Cruz. In our opinion, UCSC is a big contributor to the problem and we enthusiastically support your efforts to provide more housing on campus.

Over the past 10-15 years we have seen entire blocks become rentals in which 6-10 students are piled into 3-4 bedroom homes. These are homes needed for adult permanent residents of Santa Cruz who will stay and contribute to the health of the neighborhood. This can only happen if UCSC provides more lost cost housing to students.   I would like to see UCSC house 75-100% of undergrads. Undergrads are the most transient population and should live in complexes designed for temporary populations--not neighborhoods of single family homes (owned by out of town realtors who are all about profit). If the realtors couldn't rent the homes for obscene amounts-they could be available for permanent residents to purchase.

UC should build on their expansive property for the good of our community. Thank you for taking these steps and we hope you continue.

Claire Castagna
Robert Hatcher
139 Peyton St
Santa Cruz, CA 95060

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Community Concerns

1 message

Camille Addleman <caddlema@ucsc.edu> Mon, Oct 2, 2017 at 4:42 PM
To: eircomment@ucsc.edu

To Whom It May Concern,

I do not support the Student Housing West Project for the following reasons:

- Kresge Garden is a **cultural landscape/cultural resource**, it is not only one of the few student-spaces on campus and the oldest student-run garden, it is, and has been, a place for students and the larger community to learn and to connect. As stated by the Kresge Garden co-op, "this action [the housing project] will destroy the heart of Kresge that has been built through a long legacy of cultivation".
- The Porter Meadows are not only a **biological resource** but a **place of recreation** for students and the larger Santa Cruz community (family's, mountain bikers...etc.).
- The yellow-legged frog, Ohlone tiger beetle are **endangered species** and the California red-legged frog are **threatened species** found in the Santa Cruz area.
- In the Porter Cave/Empire Cave exists the Dollof cave spider and the Empire Cave pseudoscorpion, **species believed to exist nowhere else,** with development they could be threatened even more.
- Impervious surfaces may increase flooding in certain areas like Moore Creek.

Sincerely,
Camille Addleman

---

eircomment mailing list
eircomment@ucsc.edu
https://lists.ucsc.edu/mailman/listinfo/eircomment

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Student West Housing Project Concerns

1 message

Candace Addleman <camaddle@ucsc.edu> Mon, Oct 2, 2017 at 4:44 PM
To: eircomment@ucsc.edu

To Whom It May Concern,

I do not support the Student Housing West Project for the following reasons:

- Kresge Garden is a **cultural landscape/cultural resource**, it is not only one of the few student-spaces on campus and the oldest student-run garden, it is, and has been, a place for students and the larger community to learn and to connect. As stated by the Kresge Garden co-op, "this action [the housing project] will destroy the heart of Kresge that has been built through a long legacy of cultivation".
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- Impervious surfaces may increase flooding in certain areas like Moore Creek.

- Candace Addleman

UC Santa Cruz 2005 LRDP
Student Housing West Project
DRAFT EIR, SCOPING MEETING
(September 28, 2017)

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Commenter name: (PLEASE PRINT) Corinne O'Connell

I would like to know the impact on the community of faculty student housing individuals when the current faculty student housing is demolished in order to build the new housing.

UC Santa Cruz 2005 LRDP
Student Housing West Project
DRAFT EIR, SCOPING MEETING
(September 28, 2017)

Written scoping comments may be submitted tonight by placing them in the labeled box at the back of the room, or throughout the public review period, by mail to: Alisa Klaus, UC Santa Cruz, Physical Planning & Construction, 1156 High St., Santa Cruz, CA 95064, or via email to eircomment@ucsc.edu. The scoping period closes on October 2, 2017, at 5:00 PM.

Commenter name: (PLEASE PRINT) Corinne O'Connell

I would like to see some analysis of the anticipated traffic impact (positive or negative) as a result of the added housing.

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] EIR Comment

1 message

David@hansen.net <david@hansen.net> Mon, Oct 2, 2017 at 3:59 PM
To: eircomment@ucsc.edu

The EIR should also evaluate how well differing design options enable higher quality residential college experiences for students. Residential colleges were originally an important differentiator of the university, and it can be leveraged in the future for student mentoring and career preparation. Use the new development to strengthen colleges.

- David

David B. Hansen, Oakes, ‘76
510-686-3283
david@hansen.net

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Don't Destroy the Meadow

1 message

Daniel Schmelter <danielschmelter@gmail.com> Mon, Oct 2, 2017 at 3:50 PM
To: eircomment@ucsc.edu

- Don't take from the beauty of our campus!
- The Kresge Garden is a cultural resource.
- The Porter Meadows are a place of recreation and beauty.
- The yellow-legged frog, Ohlone tiger beetle are endangered species and the California red-legged frog are threatened species found in the Santa Cruz area.
- In the Porter Cave/Empire Cave exists the Dollof cave spider and the Empire Cave pseudoscorpion, species believed to exist nowhere else, with development they could be threatened even more.

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Concern about Student Housing West

1 message

David Shaw <daveshaw@ucsc.edu> Thu, Sep 28, 2017 at 5:16 PM
To: eircomment@ucsc.edu

To Whom It May Concern:

I am concerned about the proposed development in the Porter Meadow, currently named “Student Housing West”. My main reasons for this concern are:

- This is a sensitive habitat, with bobcats, red shouldered hawks and more. It is iconic for UCSC.
- I lead classes in the meadow.
- These units ought to be affiliated with Porter and Kresge, not unaffiliated. This would negatively impact the campus community as a whole.
- I thought 2000 beds was a bit much, and am surprised to read that the new proposed amount has been raised to 3000. When did that happen?

I look forward to hearing from you regarding these concerns.

Thanks, David

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Commenter name: (PLEASE PRINT) Daniel S. Snyder

Comments: oral comment re. karst resources underlying project area, and related biota.

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Housing West Project

1 message

Dave Wade <dmwade55@gmail.com> Sun, Sep 17, 2017 at 11:30 AM
To: eircomment@ucsc.edu

A project of this size is going to bring with it a need for more campus staff. The project EIR should take this into account. Will there be adequate, affordable housing for campus staff?

Alisa Klaus <aklaus@ucsc.edu>

Re: [eircomment] A question

1 message

Gillian Greensite <gumtree@pacbell.net> Mon, Sep 25, 2017 at 7:10 PM
To: Alisa Klaus <aklaus@ucsc.edu>

Thank you Alisa!

Gillian

Sent from my iPad

On Sep 25, 2017, at 4:43 PM, Alisa Klaus <aklaus@ucsc.edu> wrote:

> Hi, Gillian--All comments submitted at the May 4 scoping meeting, as well as written responses submitted in response to the April 10 notice of preparation, will be taken into account in developing the scope of the Student Housing West Project EIR.
>
> Alisa Klaus
> Senior Environmental Planner
> UCSC Physical Planning and Construction
> (831) 459-3732
>
> On Mon, Sep 25, 2017 at 10:37 AM, Gillian Greensite <gumtree@pacbell.net> wrote:
>
>> Hi,
>>
>> I attended and submitted oral comments which were recorded at the last scoping meeting for the EIR for the Student Housing West project.
>>
>> Are those comments still valid and will they be included in the final comments? Or do I have to comment anew?
>>
>> Thanks,
>>
>> Gillian
>>
>> ---
>> eircomment mailing list
>> eircomment@ucsc.edu
>> https://lists.ucsc.edu/mailman/listinfo/eircomment

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] food shopping for Housing West and other dorms

1 message

Glenn Millhauser <glennm@ucsc.edu> Fri, Sep 15, 2017 at 9:18 AM
To: eircomment@ucsc.edu

This may be a bit tangential to the Housing West plan, but I strongly recommend that UCSC consider placing a proper food market on campus as part of continued housing development. As it is right now, housing units have small kitchens and/or food prep areas, but no convenient place to buy groceries. The only store is the convenience market, next to the bookstore, which has essentially no fresh fruit, vegetables or other groceries needed for meal prep. Consequently, students come to the westside Safeway, which increases town traffic and contributes to the store's long lines. With a reasonably priced campus market, shopping would be much more convenient and time efficient, which would increase the attractiveness of staying in campus housing. It would also relieve the food boredom that students experience by eating daily at the campus cafeterias. Finally, it may reduce costs to attend by letting students go to simpler meal plans, given that they would be able to prepare one or more meals a day on their own. If this is considered, the store absolutely must have reasonable food prices, matching what one would find in a regular market. If the students and/or their families feel that they are being gouged, this whole plan will backfire. Please consider — thanks!

Glenn L. Millhauser
Department of Chemistry & Biochemistry
UC Santa Cruz
Santa Cruz, CA 95064
831 459 2176 voice
831 566 3337 cell
831 459 2935 fax

glennm@ucsc.edu

http://millhauser.chemistry.ucsc.edu
https://www.chemistry.ucsc.edu/about/directory-page.php?uid=glennm

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Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Notice of Preparation - impact of Student Housing West

1 message

jay capela <jcapela@mac.com> Fri, Sep 29, 2017 at 4:19 AM
To: eircomment@ucsc.edu

Hello,

I am writing to express concern about how the new Student Housing West will affect drainage and water runoff into Moore Creek, potentially increasing the likelihood that flooding will re-occur on Highview Drive, causing erosion and possible collapse of the road.

I live at 203 Highview Drive, which passes over Moore Creek about 400 feet west of where Highview Drive begins at High Street. My understanding is that in the year 2000, our access road (Highview Drive) was flooded where it crosses Moore Creek during a heavy storm event on February 13, 2000, and that a subsequent investigation found that a storm-water retention dam on the UCSC campus overtopped on that day after 4 days of rain because the University had failed to keep the lower outflow pipe of the Arboretum Dam clear of debris. However, it appears that the dams are only adequate for a 100-year rain event if the natural underground drainage called the Karst system is not clogged and accepts some of the water collected. When the Karst is clogged, the dams only can retain a 50-year storm. Considering that global warming seems to be increasing severe storm events, the dams could be overtopped more frequently than predicted by the past hydrology studies.

Regarding Student Housing West, my understanding is that the new roofs, parking lots, roads, walking paths, and other impervious surfaces will decrease the amount of rainwater that absorbs into the soil. The new construction will create much more runoff unless the University takes additional steps to retain more water during severe storms.

I would like assurances that:
1. The EIR will address these concerns, and include a new study of the off-campus downstream effects of the new project, and
2. The University will be responsible for taking steps to mitigate the impact of increased water drainage into Moore Creek caused by the new project.

Thank you,

Jay Capela

---

eircomment mailing list

eircomment@ucsc.edu
https://lists.ucsc.edu/mailman/listinfo/eircomment

Google @ UCSC

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Scope of EIR

1 message

Judi Grunstra <judiriva@baymoon.com> Tue, Sep 19, 2017 at 4:50 PM
To: eircomment@ucsc.edu

Hello, I believe the EIR should include examining the impact of the construction on area roads. Multiple trips by heavy trucks traveling up and down Bay Ave., Mission St., and whatever other routes they will take will have an impact on those roads in terms of breakdown of the roadway (which UCSC should pay for, not the City of Santa Cruz), more traffic, and air and noise pollution by those vehicles. Thank you.

Judith Grunstra
220 McMillan Dr.
Santa Cruz CA 95060

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Student Housing West

1 message

Janet Reedy <jlreedy@ucsc.edu> Tue, Sep 26, 2017 at 2:15 PM
To: eircomment@ucsc.edu

I support the addition of Student Housing West. We must supply more bed spaces to our students, as well as decrease density in existing housing.

I imagine people are going to have questions about water and parking.

Too bad there's no plan, as usual, for staff. We could really use a break.

Sincerely,

--
Janet Reedy

Assistant Director of Admissions
Transfer Evaluation and Admissions Operations
UC Santa Cruz

1156 High St.
Santa Cruz, CA 95064

Email: jlreedy@ucsc.edu
Voice: 831-459-4144
Fax: 831-459-4163

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] UCSC Housing West

1 message

Jennifer Simington <jensimington@hotmail.com> Sat, Sep 16, 2017 at 11:29 PM
To: "eircomment@ucsc.edu" <eircomment@ucsc.edu>

Hello! I am inquiring if Student Housing West would replace the existing Family Student Housing at UCSC. I am writing to stress how important reduced-rate family housing is for the student community, especially in Santa Cruz, where rents are exorbitant for two-income families, and impossible when there is one parent in school. My family lived in FSH while my husband got his PhD and I got my masters--both my daughters grew up there. We would not have been able to complete our degrees without FSH, and we are both teachers working in the Santa Cruz public school system now.

Thank you,

Jen Simington

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Student Housing West feedback

1 message

KarenEric <santacruzers@earthlink.net> Sun, Oct 1, 2017 at 5:31 PM
Reply-To: Karen&Eric <santacruzers@earthlink.net>
To: eircomment@ucsc.edu

Many I know feel the same as I do. They may not be aware of the comment period or have the time.
Many people no longer subscribe to the Sentinel, for example. And the Sentinel covers less and less.

I support decent living conditions for students which enhance and promote their learning environment. Overcrowding of dorms and absence of study halls besides the Library are unacceptable. Students and their families are paying for a quality education. The tax paying public expects better of UC. Crowded housing diminishes the learning environment and makes UC look inattentive to students.Therefore, some solution to the current overcrowding at UCSC is mandated so that more students live on campus and stay on campus. At the same time, I am fully opposed to a blanket mandate from UCOP based in Oakland that says to UC campuses: take more, grow, no questions asked. That mandate is based on the idea that every campus is the same in terms of access to the campus, local water conditions and infrastructure and community impact. That is simply not true, history matters, geography matters. UCSC is a VERY remote campus. Every graduation weekend underscores this. Mission St. leads to Bay St. which leads to campus. And then back. Santa Cruz is at a standstill currently for traffic, some related to UCSC, some not. Residents on the Westside know this very well. All business and medical appointments have to be scheduled in the morning. It would be immoral to mandate growth without examining each campus in context and without participating in solutions with cities and communities.

UCSC just celebrated its 50th anniversary.It was a beautiful location to select at the time, an historic vision, but not a sustainable decision for the longterm. There was also a decision made a long time by the City to not build a second access road that would have mitigated this. I am not commenting on that decision, only that it is a fact. It would have been better to build this campus at the other location, in the larger San Jose area. We can't go back in time. The current conditions preclude mandated growth by an outside entity. It certainly prompts me to consider contacting my legislators and the Governor. Having worked at UCSC I believe there may be existing buildings that are underutilized and/or could be converted to housing without new building. This has to be assessed independently. If growth occurs it must be accompanied by changes in UC policies: students must live on campus all 4 years, not in the community where they become commuters.

My husband and I each worked for UCSC for more than 30 years; we moved specifically to the Westside 30+years ago from another part of the County in order to be able to perform our job duties more effectively by having a shorter commute. We have more than 30 years of familiarity with the local changing conditions as both employees and as residents.

Karen Mokrzycki

UC Santa Cruz 2005 LRDP
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Commenter name: (PLEASE PRINT) Kyra Fitz

Comments: Please investigate the impact of cutting down trees + vegetation (how much CO_2 released, impact on wildlife, fires), investigate how much carbon storage would be lost by cutting down plants, investigate traffic impacts on campus + community (how will public transit be expanded to support this), considerations to plants + wildlife, especially endangered Ohlone Tiger Beetle

+ Red-Legged tree frog + endemic isopods to Porter Caves, potential erosion + damage to landscape with increased foot + vehicle traffic, watershed considerations - how will the developments impact water resources, streams, runoff, consider how mitigations will be implemented in the P3 model w/ a private developer involved

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Designation of 14 acres for housing

1 message

leticiacooper <leticiacooper@sbcglobal.net> Fri, Sep 15, 2017 at 8:31 PM
To: eircomment@ucsc.edu

To whom it may concern:
I am opposed to the change of using 14 acres for student housing. It would change the natural entrance to the beautiful entrance. It would create a traffic jam, change the environment and would bring about increased pollution to the area.

Please reconsider and look for other possible building sites. As a resident of Santa Cruz, I am strongly opposed to this proposal.

Sincerely,
Leticia Cooper

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Comments on housing west

1 message

Lexi Daoussis <lexidaoussis@gmail.com> Mon, Oct 2, 2017 at 4:57 PM
To: eircomment@ucsc.edu

To whom it may concern,
The following are concerns that I have in regards to UCSC's plan to develop housing in the western part of campus.

The Kresge garden is a cultural resource. It's a place of recreation for many Kresge students, as well as a place of refuge and agricultural cultivation. Students work diligently in the garden and work hard to ensure all students have access to it, it would be a shame to see it disappear. It would also make us one of the only colleges in campus without a garden.

Secondly, the Porter meadows are also a place of recreation. Students frequent the meadows all year round, to gather and to sometimes just escape the hustle and bustle of ucsc. For many of us this is a place of solitude that we hold sacred. It would arguably be the most disappointing part of the development of housing west. Alums even sometimes come back to UCSC to appreciate the meadows in themselves.

Thirdly, Santa Cruz is home to a multitude of endangered & threatened species such as the yellow-legged frog, Ohlone tiger beetle, the California red-legged frog. Wouldn't development just threaten / endanger these species more? In a time of loss of biodiversity you'd think it would be a priority of UCSC's to do their part in protecting these species.

Lastly, in the Porter caves / empire cave area exists the Dollof spider and the Empire cave pseudoscorpion. These are both species believed to only exist there, nowhere else! Development could potentially seriously harm the population size, putting them at serious risk of endangerment or extinction.

These are all concerns that many of my fellow peers share. I speak on behalf of many on this issue, as many students at UCSC have continued to express discontent on the plans for housing west, we hope you take this input into your environmental impact report and proceed with caution.

Regards,

Lexi Daoussis

Google @ UCSC

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] EIR Public Comment

1 message

'Marion Brodkey' via eircomment@ucsc.edu <eircomment@ucsc.edu> Mon, Sep 25, 2017 at 1:10 PM
Reply-To: Marion Brodkey <mbrodkey57@yahoo.com>
To: "eircomment@ucsc.edu" <eircomment@ucsc.edu>

Dear EIR committee:

I'm concerned about the recent proposal to increase student housing by allowing **private** development of a 3000-bed dormitory on UCSC's campus. Some aspect of this might make sense if at the same time UCSC enrollment wasn't approved for an increase, and there wasn't already a housing crisis amongst UCSC students, and there wasn't already a housing crisis amongst Santa Cruz residents, and there wasn't already a housing crisis for people who are currently houseless, and there wasn't already a problem with unjust evictions for renters.

Development of UNaffordable housing as the new normal in Santa Cruz, waiving the in-lieu fee as well as the requirement for "affordable" (for whom?) housing, is criminal. As a registered nurse working at the county clinic, if I weren't already safely housed, I would not be able to live and work in Santa Cruz. I can't imagine what it must be like for students from outside Santa Cruz trying to get an "affordable" education at their very own state school. Not to mention those from families with no previous college grads trying to get by with the help of food stamps and upwards of $100,000 in loans. Shame on UCSC!

And: How and when will the EIR study alternatives to this outrageous plan as part of its environmental and cultural review? Please do not allow for-profit STUDENT housing too to become the new normal in Santa Cruz.

Sincerely,

Marion Brodkey
3565 Roland Drive
Santa Cruz, CA 95062

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Concerned about housing expansion

1 message

Melissa Vergara <mnvergar@ucsc.edu> Mon, Oct 2, 2017 at 4:16 PM
To: eircomment@ucsc.edu

Hi,

I am a concerned UCSC student. Porter meadows is a sort of wildlife corridor between the campus and the larger upper campus. There are threatened and endangered species living in these spaces. Increased housing will disrupt the integrity of these wildlife spaces.

Although I am an avid champion of education and believe there should be students reaping the opportunities present at UCSC, I oppose the expansion of our student body at this moment. There are spatial limitations we should be respecting. We should also be respecting the community of Santa Cruz in not accepting more applicants each year.

I urge that we respect the wildlife and community that has been present and supportive of our campus for many years by NOT expanding our student body or housing.

Sincerely,

--
Melissa Vergara

Rachel Carson College, UCSC
Physical and Biological Sciences
(831) 332-6910

> If my decomposing carcass helps nourish the roots of a juniper tree or the wings of a vulture -- that is immortality enough for me. And as much as anyone deserves." - Edward Abbey

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Submission to EIR NOP Student Housing West

1 message

Matthew Waxman <waxman.matt@gmail.com> Sun, Oct 1, 2017 at 8:51 PM

To: eircomment@ucsc.edu

To Whom It May Concern,

One of the purposes of an EIR is to properly and thoroughly address alternatives to the project.

Please evaluate multiple alternatives to the Student Housing West Project by studying all of these:

1. Alternatives to the west campus site being proposed.

2. Alternatives that combine the use of multiple sites across the campus -- on the east, west, north and south -- to achieve the housing goals.

3. Alternatives that use thoughtful site planning and phasing strategies to develop academic buildings and student resources on the same site(s) as the additional housing added to UCSC. This could be a way to use the western site, but to create new Residential Colleges out of it.

4. Alternatives that achieve the housing goals by proposing the addition of new Residential Colleges at the site instead of unaffiliated housing. This would acknowledge the valuable synergy for the benefit of students that exists between academics, student resources, social and public spaces, and housing. This is in-line with the planning goals and principles of the UCSC 2010 Design Framework, the 2005 LRDP, the 1988 LRDP, and all prior long range planning documentation.

5. Alternatives acknowledging that in the 2014 Student Housing Market Study it is clear that the poll taken discovered that 73.32% of students polled want the University to “create more academically-focused residential communities" (2014 Student Housing Market Study, PDF page 31 and 86), and thus there is additional legitimate basis for the University to continue to use the Residential College model as an organizing principle for new housing.

6. Alternatives acknowledging past projects that can serve as viable alternatives, such as the East Campus Infill Housing project that was approved by the Regents, but was then cancelled by UCSC in 2009 due to UCSC's concern of having (at that time, post economic crash) empty beds; as well as the West Campus Infill Housing proposed as an alternative within that 2009 East Campus Infill Housing EIR. Each of these would provide 600 beds, so combined they would add 1200 beds, which would reduce the size and impact of the proposed Student Housing West site. (link to East Campus Infill Housing EIR -- http://mediafiles.ucsc.edu/ppc/OtherEnvdocs/ECI/ECIFEIR.pdf)

7. Alternatives considering the use of sites off campus that are owned by UCSC, such as the Delaware Ave. site, or land that could be purchased by UCSC and much more cost-effectively developed than the complex land of the campus.

8. Alternatives that pursue a Philanthropy driven-approach to pay for the project, instead of the public-private partnership that will produce a private developer

Monopoly on-campus.

9. Alternatives that see what would happen if UCSC made the decision to slow its student enrollment growth, and added the same number of beds over a much longer time-frame, thus making this current project much smaller.

10. Alternatives that see what would happen if UCSC decided to halt and diminish its enrollment growth, so as to not require building the project at all.

Thank you,
Matthew Waxman

--
Matthew Waxman
Porter College Councilor - UCSC Alumni Council
UC Santa Cruz 2006 | Harvard GSD 2012

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] student housing ucsc

1 message

Nancy Maynard <mtnmom3@gmail.com> Thu, Sep 14, 2017 at 1:20 AM
To: eircomment@ucsc.edu

Living on or very near campus makes difference in any students university experience.. My daughter went to Claremont... 98% live on campus all 4 years. The friends she made there are a big part of her life 15 years later. I went to UC. I have one friend that I still stay in contact with... My classmates were sprinkled around Berkeley in different buildings... There was no real community to keep in touch.

You are denying students a valuable lesson in networking and community responsibility by allowing developers to put up miscellaneous apt buildings around town. Please consider a university housing complex with apts, shops and eateries included... Maybe even put it in Scotts Valley with shuttles. A real living community.

Make it award winning... a showcase... something to be proud of.Something with common space to be shared and welcoming...

Yours,
Nancy Maynard
Santa Cruz

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Environmental impact of UCSC housing plan

1 message

Nathan Perisic <nperisic@ucsc.edu> Mon, Oct 2, 2017 at 3:34 PM
To: eircomment@ucsc.edu

Hello,

As a student here in Porter, I am strongly against UCSC plans to develop housing on the west side of campus

That area is beautiful and already housing family students, where will they go when their homes are destroyed for Freshman you can move somewhere else (Expand Stevenson, Make Cowell higher, Add floors on top of Kresge, there are smarter ways to add housing than this you guys come on).

For all the reasons previously listed,

- The Kresge Garden is a **cultural resource.**
- The Porter Meadows are a **place of recreation**.
- The yellow-legged frog, Ohlone tiger beetle are **endangered species** and the California red-legged frog are **threatened species** found in the Santa Cruz area.
- In the Porter Cave/Empire Cave exists the Dollof cave spider and the Empire Cave pseudoscorpion, **species believed to exist nowhere else,** with development they could be threatened even more.

I think it is obvious building freshman dorms on the west side of campus is a cheap money scheme by the UC and they should be ashamed of themselves for even considering it.

Signed,
Nathan Perisic
1474224

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eircomment mailing list
eircomment@ucsc.edu
https://lists.ucsc.edu/mailman/listinfo/eircomment

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Commenter name: (PLEASE PRINT) Natalya Jackson

EIR is meant to consider the community as well as ecological impact, so many questions unanswered. How does adding 3000 beds, then increasing enrollment by more than that, help the existing housing crisis in the county which is partially due to enrollment levels which already exceed the sustainable carrying capacity of our community as a whole? There are currently homeless students. Last year I spent four months homeless, with a Masters' degree, while working as a TA to continue in the mathematics PhD program, as a single mother. While struggling to find a studio for under $2000/mo, we considered a converted toolshed with no bathroom in Bonny Doon for $1450/mo, but couldn't come up with the $5000 deposit. I share the sincere concerns regarding the drastic ecological impacts of this project, and hope UCSC chooses to find a solution for the housing crisis which does not destroy the habitats and geological features in the area. But regardless, before the University even considers increasing enrollment, the existing housing crisis must be addressed. How many students are currently unhoused or underhoused?, How many faculty?. Until these numbers are made public record, we have no way to intelligently assess whether this increase in housing is enough to even mitigate the current crisis.

Google @ UCSC

Alisa Klaus <aklaus@ucsc.edu>

Re: [eircomment] My input on the UCSC NOP and proposed Student Housing West project: drainage plan

1 message

'Robert Garon' via eircomment@ucsc.edu <eircomment@ucsc.edu> Mon, Oct 2, 2017 at 3:03 PM
Reply-To: Robert Garon <rdgaron@yahoo.com>
To: Stanley Sokolow <stanleysokolow@gmail.com>, "eircomment@ucsc.edu" <eircomment@ucsc.edu>
Cc: Chris Krohn <ckrohn@cityofsantacruz.com>, Supervisor Neal Coonerty <bds031@co.santa-cruz.ca.us>, Santa Cruz City Council <citycouncil@cityofsantacruz.com>

Sirs:

I am the President of the Highview Roadworks Association, and I was involved in the negotiations with UCSC in March 2000. I have the same concerns as indicated in Stanley Sokolow's letter of 9/25. I have seen what happened when our 14" culvert could not handle the outflow from a 48" culvert into Moore Creek. The water created a lake on one side of the road and overflowed it about 2 feet deep. Although we eventually added an overflow culvert, I doubt that it will be able to handle the increased flow from the project surface runoff. The University should consider channeling the runoff into a storm drain leading to the ocean, not into Moore Creek. If this is not done, the University should provide funds to increase the culvert size under Highview Drive. If this is not done, the next overflow could undermine the road, essentially cutting it off to the residents on Highview Drive and Highview Court.

Bob Garon

On Monday, September 25, 2017 3:54 PM, Stanley Sokolow <stanleysokolow@gmail.com> wrote:

Dear UCSC:

On February 13, 2000, Moore Creek south of the campus flooded over the only road which accesses the 20-parcel neighborhood where I live, making the road impassible and probably causing some erosion of the embankment on the downstream side of our road. Subsequent investigation revealed that UCSC has 3 dams in the Moore Creek watershed which retain stormwater and release the water slowly into the creek. The University had failed to maintain the lower outflow pipe of the Arboretum Dam free of debris, which caused the water level to rise during 4 days of heavy rain and spill over into the creek. All subsequent rain draining into the dam then flowed through the upper spillway pipe into the creek, under Empire Grade, and into the portion of Moore Creek which flows through the culvert pipe under our road, Highview Drive. Our drain pipe under the road could not keep up with this greatly increased outflow from the University, although it had always been adequate prior to the event on February 13. After that flooding event, at great cost to the property owners, we added an additional culvert pipe to more than double the flow capacity under our road. We haven't had any flooding since then.

The new housing project being proposed would increase the amount of impervious surfaces above what now exists in the Moore Creek watershed on campus. Even if the Arboretum dam outflow pipe is maintained free of debris, increased runoff from the new project could exceed the retention capacity of the dams. The documents I found said that the dams are only adequate for a 100-year rain event if the natural underground drainage called the Karst system is not clogged and accepts some of the water collected. When the Karst is clogged, which happens randomly, the dams only can retain a 50-year storm. Considering that global warming seems to be increasing severe storm events, the dams could be overtopped more frequently than predicted by the past hydrology studies. Moore Creek in our neighborhood flows along the city-county boundary line, so both jurisdictions would be concerned with off-campus impacts to the creek.

My concerns:

- Will the University's storm-water retention system be adequate to prevent an increase in the outflow going off campus under Empire Grade and into our portion of Moore Creek?
- Will our 2-pipe culvert under Highview Drive be adequate for the new and increased peak inflows coming from the campus?
- Will increased flow cause erosion of the banks of the creek adjacent to our road, causing collapse of the road into the creek?
- What will UCSC do to mitigate these impacts?
- Will the EIR include a new study of the stormwater retention system and off-campus downstream impacts of the new project? It should.

Sincerely yours,

Stanley M. Sokolow
210 Highview Drive
Santa Cruz, CA 95060
831-425-3589

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Concerns About West Expansion

1 message

scbrice scbrice <scbrice@ucsc.edu> Mon, Oct 2, 2017 at 3:12 PM
To: eircomment@ucsc.edu

Hello I am third year UCSC student and I am concerned with the land we will lose from expanding west. The Kresge Garden in a cultural space and area for community gathering. The Porter Meadows provide another meeting ground and also encompass the Porter Caves home to the Dolloff cave spider and the Empire Cave pseudoscorpion which are believed to not be found anywhere else and therefore would be threatened by development. Thank you for hearing my concerns regarding this development project.

Best,

Salina Brice

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] EIR Public Comment

1 message

Sheila Carrillo <escuelita@baymoon.com> Mon, Sep 25, 2017 at 11:52 AM
To: eircomment@ucsc.edu

Hello,

I am a resident of the Westside of Santa Cruz. I am concerned about the proposed UCSC housing project and wondering if community members are privy to a detailed EIR report that addresses potential effect of the project on flora and fauna and forested area s, as well as detailing mitigations for the traffic that will be generated by 3000 additional residents. I am also concerned by the prospect of a private developer who will be solely operating this large project. More transparency and information required.

Thanks,

Sheila Carrillo

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] I would like to support the housing on campus.

1 message

Sara Cordell <sara.cordell@earthlink.net> Wed, Sep 27, 2017 at 2:10 PM
To: eircomment@ucsc.edu

Hello.

Since I cannot be at the public meeting, I would like to add my comment.

I support the west campus housing, because more on-campus housing can help mitigate the housing shortage in Santa Cruz for at least a time. UCSC has a good record saving water, and I expect that savings to be built into the housing being planned. I expect that electric power and internet grid support services will also be built to be as eco-friendly as possible. This will likely be more innovative and environmentally friendly that privately developed properties elsewhere in the city and county.

It is also my hope that an additional route onto the campus from Highway 1or 17 will be built to reduce traffic impacts on High Street and Bay Street for campus transportation needs.

Yours,
Sara Cordell
116 Ross St, Santa Cruz

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eircomment mailing list
eircomment@ucsc.edu
https://lists.ucsc.edu/mailman/listinfo/eircomment

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Student Housing West

1 message

Sloane Devoto <sloane@sloanedevoto.com> Tue, Sep 19, 2017 at 8:37 PM
To: eircomment@ucsc.edu

First, let me say I am a graduate of UCSC, Merrill 82. I live on the westside near the university. For four years I have had endless issues with rude, entitled students. I have also experienced polite, courteous, students. The campus is stunningly beautiful and I am for protecting that beauty at all costs. Its exceptional. But you need to be realistic and develop housing for the increase in student population. You're going to have to spend money. Maybe tighten your belts, reduce lackey staff/professors, make some sacrifices with pensions and perks. Actually be serious and be dedicated towards education, moving away from anchoring your importance on nouveau riche values. Then work with the city on finding a place to develop off campus housing. Over by Harvey West Park. Along Ocean St. It will be difficult and expensive. But caring, yes, the word "caring" can make all the difference. Care about the beauty and ambience of the campus. Care about the neighborhoods. Care about putting students in an appropriate area where they can be together to make the noise and energy that people that age need to make. This is the reality. You can't have your cake and eat it too…did you not learn this? You can't increase the population to the degree you have and want, without a good solid plan. But, wait, you already did this. From here on, think first and don't make it worse than it already is. Care. What will housing for 3000 students on the campus do to the campus? It doesn't address the influx of the totality of the increases in student population for the next few years, so is it worth it?

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Student Housing West Progect

1 message

Sofie Salama <ssalama@soe.ucsc.edu> Fri, Sep 22, 2017 at 7:22 PM
To: eircomment@ucsc.edu

Dear Sir or Madam,

In response to the campus request I have reviewed the Notice of Preparation for this project. I am heartened to see that the campus is adding badly needed student housing and hope that this project will move forward.

I was surprised to see that there was no mention of associated efforts to deal with traffic and discourage additional student vehicles. I believe that a critical part of any campus housing expansion should be efforts to improve public transportation and limit student vehicles on campus. The number of students driving to campus is unacceptably high, but they will only give up there cars if there is regular reliable bus service both within the campus and between the campus and the greater Santa Cruz area.

Sincerely,

Sofie Salama

--
Sofie Salama, PhD
Director, Laboratory Research, Haussler Lab
UC Santa Cruz Genomics Institute
and Howard Hughes Medical Institute
University of California, Santa Cruz
Office: 831-459-2814
Lab: 831-459-1014
Fax: 831-459-1809
http://genomics.soe.ucsc.edu/

Google @ UCSC

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] My input on the UCSC NOP and proposed Student Housing West project: drainage plan

1 message

Stanley Sokolow <stanleysokolow@gmail.com> Mon, Sep 25, 2017 at 3:54 PM
To: eircomment@ucsc.edu
Cc: Chris Krohn <ckrohn@cityofsantacruz.com>, Supervisor Neal Coonerty <bds031@co.santa-cruz.ca.us>, Santa Cruz City Council <citycouncil@cityofsantacruz.com>

Dear UCSC:

On February 13, 2000, Moore Creek south of the campus flooded over the only road which accesses the 20-parcel neighborhood where I live, making the road impassible and probably causing some erosion of the embankment on the downstream side of our road. Subsequent investigation revealed that UCSC has 3 dams in the Moore Creek watershed which retain stormwater and release the water slowly into the creek. The University had failed to maintain the lower outflow pipe of the Arboretum Dam free of debris, which caused the water level to rise during 4 days of heavy rain and spill over into the creek. All subsequent rain draining into the dam then flowed through the upper spillway pipe into the creek, under Empire Grade, and into the portion of Moore Creek which flows through the culvert pipe under our road, Highview Drive. Our drain pipe under the road could not keep up with this greatly increased outflow from the University, although it had always been adequate prior to the event on February 13. After that flooding event, at great cost to the property owners, we added an additional culvert pipe to more than double the flow capacity under our road. We haven't had any flooding since then.

The new housing project being proposed would increase the amount of impervious surfaces above what now exists in the Moore Creek watershed on campus. Even if the Arboretum dam outflow pipe is maintained free of debris, increased runoff from the new project could exceed the retention capacity of the dams. The documents I found said that the dams are only adequate for a 100-year rain event if the natural underground drainage called the Karst system is not clogged and accepts some of the water collected. When the Karst is clogged, which happens randomly, the dams only can retain a 50-year storm. Considering that global warming seems to be increasing severe storm events, the dams could be overtopped more frequently than predicted by the past hydrology studies. Moore Creek in our neighborhood flows along the city-county boundary line, so both jurisdictions would be concerned with off-campus impacts to the creek.

My concerns:

- Will the University's storm-water retention system be adequate to prevent an increase in the outflow going off campus under Empire Grade and into our portion of Moore Creek?
- Will our 2-pipe culvert under Highview Drive be adequate for the new and increased peak inflows coming from the campus?
- Will increased flow cause erosion of the banks of the creek adjacent to our road, causing collapse of the road into the creek?
- What will UCSC do to mitigate these impacts?
- Will the EIR include a new study of the stormwater retention system and off-campus downstream impacts of the new project? It should.

Sincerely yours,

Stanley M. Sokolow

210 Highview Drive
Santa Cruz, CA 95060
831-425-3589

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Minutes from today's (9/28) open forum

1 message

Sabina Wildman <swildman@ucsc.edu> Fri, Sep 29, 2017 at 12:00 AM
To: eircomment@ucsc.edu

Dear Student Housing West folks,

I am a student who attended the open forum at the Louden Nelson Community Center tonight and I wanted to get a copy of the typed public records of what was said to share with the UCSC student community. If you could please send them to me as soon as possible, that would be fantastic!

Thanks so much,
Sabina

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eircomment mailing list
eircomment@ucsc.edu
https://lists.ucsc.edu/mailman/listinfo/eircomment

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Comment onStudent Housing West Project

1 message

Susan Wright <supwrigh@ucsc.edu> Mon, Oct 2, 2017 at 10:43 PM
To: eircomment@ucsc.edu

I understand that the proposed plan to house 3,000 more students on the campus is a response to both the UCOP requirement that UCSC increases the number of students on the campus to 21,000 or more by 2020-21 and the requirement of the City of Santa Cruz to house at least 50% of its students on campus. Although the University can comply with these requirements with the proposed new housing, it is, at the same time, contemplating an increase in the student body of at least 3,000. That increase, even if all of it is accommodated on campus, seems likely to increase the stress on a city that is highly already stressed in terms of water resources, traffic, and housing. The EIR needs to addressin detail all of these impacts on the City.

On campus, the building of housing that does not conform to the existing college system at UCSC suggests that UCSC will experience a radical change in the quality of education. What will be the impacts of a large housing complex with few or no educational facilities on class size, professor/student ratio, and facilities for study, lectures, and recreation?The EIR should address in detail the impact on the education provided by the University as well.

Susan Wright, Ph.D.

Professional Researcher, History of Science and International Relations

Department of Politics

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] EIR Public Comment

1 message

Valerie Leveroni Corral <valerie@wamm.org> Tue, Sep 26, 2017 at 12:52 AM
To: eircomment@ucsc.edu

To Whom It May Concern;

I have recently been a party to a small portion of the multifaceted process of information gathering prior to an EIR report. After observing the unfolding I wonder if there is a metric used to measure optimum outcome that includes alternatives to the project in its present form?
As our community faces changes that swiftly move toward increasing cost of living, how does your project protect long time residents and our families?
Is there a metric to weigh community happiness and financial sustainability for residents as we age and look toward retirement?

Valerie Leveroni Corral

WAMM

Director

815 Almar Ave. Ste.#2

Santa Cruz, CA 95060

831.425.0580

"Through our eyes the universe is perceiving itself,

And through our ears the universe is listening to its cosmic harmony and

we are the witness through which the universe becomes conscious of its

glory, of its magnificence." Stephan Pashov, Arctic CAT driver and philosopher

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eircomment mailing list

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] EIR!

1 message

William Yates <wyates@ucsc.edu> Thu, Sep 14, 2017 at 12:29 PM
To: eircomment@ucsc.edu
Cc: seclead-group@ucsc.edu

Ms. Claus,

As a Plant Sciences major and Stewardship intern with the Campus Natural Reserve, I search for and notice rare plant and animal species.

Late this Spring quarter, wandering through the Porter Meadow, I found a clump of *Calochortus luteus*, or yellow mariposa lily, at the western edge of the central chaparral patch. Nowhere else on campus have I seen this wildflower, which is endemic to California and rare in the Santa Cruz area. It is one of exceptional beauty: those flowers still wave in the breeze in my mind's eye.

The Porter Meadow may well host many such species.

Will the university survey the species composition and distribution of the meadow as part of its plan? With such information, will the architects and planners place buildings so as to minimize their impact on rare species, seasonal waterways and wetlands, and wildlife?

Will the planners attempt to reduce light and noise pollution of the surroundings through sensible design? Will they locate paths and entrances so as to make unofficial paths, which usually erode severely, unnecessary?

Will they design buildings that are part of the landscape rather than an imposition on it?

The natural ecosystems on campus are an aesthetic and a practical resource in an increasingly developed county, state, country, and world. I hope that they will continue to provide water, air, and joy ten, thirty, and a thousand years from now. The decision of how to treat them is ours to make.

—William Yates, generally known as "Cactus"
Assistant Editor, *The Fishrap Live!*

TRANSCRIPT

UCSC STUDENT HOUSING WEST PROJECT

EIR SCOPING MEETING

SEPTEMBER 28, 2017

JOLIE KERNS: I think we are going to go ahead and get started. So thank you all for being here tonight.

Welcome to the scoping meeting for the UC Santa Cruz Student Housing West Project. This is for the Environmental Impact Report, or EIR.

So we are going to provide a bit of background on the process and a proposed project. Then we'll have a few minutes for questions. And the main purpose of this meeting is to really allow for members of the public and representatives of public agencies to provide oral comments on the environmental issues that should be covered in the EIR for the project.

So we are going to introduce some of our UCSC kind of staff involved in the project and then describe the CEQA process, a little bit more information about the project, and then some background on the notice of preparation.

So I am Jolie Kerns. I am the interim planning director at UC Santa Cruz.

ALISA KLAUS: And my name is Alisa Klaus. I am a senior environmental planner, and I generally am responsible for the EIR process on the campus.

STEVE HOUSER: I am Steve Houser. I am the capital planning director for UCSC housing on the campus.

KEITH BRANDT: I am Keith Brandt, the vice chancellor for university relations. We deal with the public.

THE SPEAKER: Thank you. Nobody applaused?

KEITH BRANDT: Thank you.

THE SPEAKER: You deserve it for your dedications.

MARC DESJARDINS: My name is Marc DesJardins, executive of communications at UCSC. Thank you.

MELISSA WHATLEY: Hi. Melissa Whatley. I am government community relations for UC Santa Cruz.

TRACI FERDOLAGE: Hi, everybody. I am Traci Ferdolage. I am the assistant vice chancellor for physical planning, development, and operations and enrollments.

ALISA KLAUS: And we also have Angela Pan, who is with the Impact Sciences, who is the consultant who is preparing the environmental impact report for this project.

So I am just going to give you a little bit of background on the CEQA process. I know some of you are old hands at it, but maybe some of you would just like a little refresher.

The California Environmental Quality Act, or CEQA, requires that any state or local agency identify the significant environmental impacts of their actions and avoid or mitigate those impacts, if feasible.

A public agency is required to comply with CEQA when it takes an action which may cause either a direct physical change in the environment or reasonably foreseeable indirect change in the environment.

Under CEQA, an environmental impact report, which we will be preparing for the Student Housing West Project, is a detailed statement that describes and analyzes the environmental -- the significant environmental impacts of a project and discusses ways to mitigate or avoid those effects.

As a first step in the EIR process, the public agency -- in this case, the University of California -- circulates a Notice of Preparation for the EIR. That Notice of Preparation initiates a 30-day period in which agencies and members of the public may provide input on the scope and content of the EIR.

So Jolie is going to provide a little bit of background on this -- actually, Steve and Jolie will provide some background on the project, and then we'll talk a little bit more about the CEQA process for the project.

STEVE HOUSER: Sure. So before getting into the specifics of the project, I'll explain the housing program, what it has done and then what is planned to do in the future.

Currently the campus has about 9400 beds for students, approximately. I am rounding up a bit, but -- and of those beds, 9200, approximately, are located on the campus proper. Of the 9200, over 8,000 are college-based. So, you know, for the most part, these dark blue land zoning areas, CSH, are colleges, and the over 8,000 beds are within those college areas. Ten colleges are approximately 800 beds per college.

Those college beds are fulfilling demand for students, first- and second-year students. So every frosh who comes to campus affiliates with one of the ten colleges. 98 percent of those frosh live within a college. We give them a two-year guarantee, and most of them choose to stay their second year.

Generally speaking, those frosh live in a res hall their first year and then matriculate through to an apartment type of living their second year.

The issue that housing has had is being able to capture those students for the third and fourth year. We just don't have enough inventory to retain those students in apartments going forward. Right now, with the two-year guarantee, we have so many students. They live there for the first and second year. By the third year, we can't offer them any space because those spaces are taken by the frosh and the sophomores.

The concept here is to capture those students and house them on campus to meet both demand as well as obligations we have with the city and county and community groups to proportionally deliver housing in response to enrollment growth. And our program is to capture juniors and seniors in apartment-style living that is not college-affiliated, but rather student-affiliated. So, in other words, students of differing colleges could choose to live together on one site.

Without hogging too much time, there are challenges with trying to increase the density within each college. We've tried doing that before, but ultimately those spaces within the college footprints are limited, and there's only so far you can go before you just trigger all sorts of circulation, parking, other types of issues.

So right now the program plan is to deliver a total of 3,000 beds, non-college-affiliated, in this general area, which Jolie will describe further, that will, again, capture juniors and seniors and keep students on campus as they matriculate through.

JOLIE KERNS: Yeah. So just to give you kind of a quick orientation, you all have the site map that we gave you. That site map is showing this area right here.

So you are seeing Empire Drive and the connection, kind of western entrance to the campus and this kind of area here. This upper northern area with the red is shown up in this area, and then the red bubble to the south is in this kind of developed area.

So right now, as Steve said, we are looking at providing up to 3,000 new beds of student housing. So these are upper division undergrad students. All it's for graduate students and students with families. And then the project will also include support spaces, site amenities, and associated kind of site development and infrastructure and utilities.

The campus anticipates that the project will be constructed in phases with at least 900 beds to be available by July 31, 2020, and the remainder of the project to be completed by July 2022.

So a public-private partnership model is being used to deliver the new housing. So part of this process is selecting -- is of selecting a development team.

The campus issues a request for proposals that identified a 50-acre project site. What you are seeing here is the kind of larger -- this is about 50 acres. The only areas that will be built within are within these kind of red boundaries. And the final boundaries are yet to be determined. And the design is -- we are not at the design part yet. So they are just starting to kind of look at where within these boundaries we should be developing. So these two potential building sites were identified, and these building sites are shown on the figure here.

So the campus has selected a development team to design and build the housing, and we are working with this team on these preliminary concepts, and they'll determine the specific site boundaries and the number and size of buildings and other elements of the project.

So what you are seeing here is just the very kind of beginning stages.

Yeah?

THE SPEAKER: How many parking spaces do you --

JOLIE KERNS: We have a ratio for what we use for upper division. I think there's around 4- or 500 right now. I am not -- the final parking spaces, just like kind of the marking of some buildings, are still yet to be determined. But, yeah, I think we are around -- yeah. And it's not yet determined, I should say, so -- but there is -- there are parking ratios for families and for the upper division and for the grad students.

MICHAEL WONG: You referenced 3,000 beds for students. Does the 3,000 include families, i.e., children and spouses who are not students that are attending UCSC with their spouses?

STEVE HOUSER: I can answer.

JOLIE KERNS: Yeah, sure.

STEVE HOUSER: So the 3,000 beds, we count family apartments as one bed. A family -- a student -- you would have to be a student to be a student family, and that student would be -- it would be a minimum of one student in that apartment bed. But the apartment would have two bedrooms. So the family -- we have 125 family units in the program. Okay? It is possible that two partners could both be students, but there could be some children who are students. We have older students with children who are students. But, generally speaking, you are looking at 125 students and families in the program.

ALISA KLAUS: The other family members are not counted among those 3,000.

MICHAEL WONG: My point is, the 3,000 is not really 3,000. Maybe 3500?

ALISA KLAUS: Some larger. Slightly larger number, right, in terms of the number of people that would actually be living there.

STEVE HOUSER: Yeah.

LAUREEN WONG: I am looking at the proposal. Is there anywhere in this proposal where they talk about the impacts to the increased students on the community access from Highway 1 and Highway 17 through the neighborhoods?

Is there any traffic -- traffic impacts --

JOLIE KERNS: The traffic impacts will be studied within the EIR's analysis.

LAUREEN WONG: But it's not currently anything that's published; is that correct?

ALISA KLAUS: Right. Yes. I'll talk about where we are with the environmental process in a minute.

STANLEY SOKOLOW: Yeah. So some of the new housing -- the ultimate project would be built where the current family student housing is. That will be demolished and rebuilt.

JOLIE KERNS: Right.

STANLEY SOKOLOW: Do you have any concept of how high the buildings will be when they are done? I am concerned about how much impervious surface will be added above what's already there. Do you have any idea? I know you haven't designed it yet, but is there a concept?

JOLIE KERNS: Right. We do anticipate a bit more density. Obviously there's a larger number of beds than the current units that are here. So it will be more dense than what you are seeing here. And I think we are looking at a lot of stormwater premanagement strategies, water reuse strategies to be employed. Yeah. So those are all likely going to be part of the project. And I think once we get to that point, it would be great to share some of those strategies with you.

Does that answer --

ALISA KLAUS: And that will be --

STANLEY SOKOLOW: I am sure it will come out. Yeah.

ALISA KLAUS: That's one of the topics that will be covered in the environmental impact report.

STANLEY SOKOLOW: Yeah. I'm sure you will have a drainage analysis.

KEITH BRANDT: Maybe you should finish your part before we get to questions.

STANLEY SOKOLOW: Let's go back to your presentation.

ALISA KLAUS: Right. I am going to talk a little about the Notice of Preparation and how this gets into the whole environmental impact report process.

I am sure a lot of you already received a Notice of Preparation or you found it online, but if you didn't, I have some extra copies that I can -- maybe you can hand them out if people haven't seen that.

So the Notice of Preparation, which announced that the university is preparing an environmental impact report, was issued on August 28. Some of you may be aware that we issued a Notice of Preparation in April, April 2017. And I want to just explain the relationship between those two.

So the notice that we issued in August 28 revises the -- is a revised version of the Notice of Preparation that was published in April 2017. That April 2017 notice described an amendment to the UC Santa Cruz long-range development plan, or LRDP, land use plan.

This is the LRDP land use map, which assigns -- it's like a general plan, land use map. And at that time, the university anticipated a land use amendment that would have changed the land use designation of this 14-acre light blue area from campus resource land to colleges and student housing. And that was to kind of develop a whole 50-acre site that we could request proposals from developer teams.

However, since the release of that original Notice of Preparation, we have advanced the planning for the Student Housing West Project, and we have determined that we are now at a point where we are ready to begin the project-level analysis of that 3,000-bed student housing project, rather than just sort of an LRDP amendment, as a preparation for that.

In addition, we have revised the boundaries of the area that may be developed, and the land use amendment may not be required after all.

So you can refer back to this handout, where we have sort of a larger -- the larger dotted line, which includes the sort of pink areas, and that was the original 50-acre site. The areas within the thicker dotted red line, those are the areas that could be included in the development at this -- that we are planning at this time.

So the revised Notice of Preparation is for a project-level environment impact report that will evaluate and disclose the environmental impacts from the construction and operation of the Student Housing West Project. The EIR will cover all of the issue areas identified in Appendix G of the CEQA guidelines, which include esthetics, agricultural and forest resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials.

MICHAEL WONG: Question. This EIR report that you are referring to, is that for the entire 3,000-bed project or is it just for specifically the one you are addressing right now, which is the 900?

ALISA KLAUS: But can I finish my sentence? Let me just finish my sentence, and then --

So geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology, water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and utilities and service systems.

In addition, the EIR will include an updated water supply and population and housing analysis for the 2005 long-range development plan as a whole and a new greenhouse gas emissions analysis for the 2005 long-range development plan.

And, yes, this will for the entire 3,000-bed project.

So the campus anticipates that we will be publishing a draft EIR for the project in January 2017. We will announce that on the physical planning and construction -- the UCSC website in the press, which is through our campus CEQA mailing list and through the State Office of Planning and Research.

2018. It says 2017 here, but I meant 2018.

And so I know some of you are already on our mailing list, but if you wish to receive any of the future notifications, if you want to be notified when the draft EIR is published, then there's a sign-up list at the -- on this table back there to be added to our mailing list.

After publication of the draft EIR, the public and agencies will have 45 days to comment on a draft EIR, and during that time, we will have another public comment session, where you can comment on the analysis that is actually in the draft EIR. And the EIR, of course, will include a lot more -- will include the detailed project description.

The campus will then include a -- prepare a final EIR, which will include its responses to all comments made on the draft EIR and revisions to the draft that may have been made in response to comments.

And then the university will then consider whether to approve the proposed action and certify the EIR. We anticipate that this action will be considered by the region in May of 2018.

So we have some time for questions and answers, but I would like to ask, first of all, since one of the main purpose of this meeting is for people to provide comments on the scope, which will be after sort of an informal question-and-answer session -- we will have those comments recorded by the court reporter.

So how many people are interested in providing an oral comment on the content of the EIR? One, two, three, four -- six. Maybe another one.

So I think we'll -- probably what we'll do is we have -- we'll have about half an hour for that. I think we probably should do that, get started on that, and then we may have some additional time for questions and answers after that.

So if you would like to make a comment, you please fill out one of these request-to-speak forms. And write your name clearly on the form because this will be needed for the transcript. So she wants to make sure that she gets your name right. And if you do not want to make an oral comment but you would like to make a written comment, you can do that.

I don't know where the rest of the comment forms went. No. They are here.

This is the comment form. And you can also make comments online.

THE SPEAKER: And where's the box to put them in?

ALISA KLAUS: We don't have a box to put them in.

JOLIE KERNS: I can take them.

ALISA KLAUS: Jolie and I will collect them.

So who else would like a speaking form?

STEVE HOUSER: Currently -- I hear your question is basically is it going to relieve kind of the student impact in the community or not with respect to total enrollment? I mean, the housing -- basically the total housing supply vis-a-vis the total enrollment count? Is that kind of another way to put your question?

SANDRA IVANY: Well, I guess. We know you are expanding and taking more students in. So is this housing to absorb those new students or -- and what percent -- in addition, what percent of the existing students, the ones that aren't the new add-ons, are you going to be moving? I imagine you are going to be moving housing and putting it on the campus that would no longer be in the community. Or is it simply for the new -- the expansion you are going --

STEVE HOUSER: Sure. So I think I get the gist of your question. Then I'll try to answer it. And if you need more information, just follow up with another question.

SANDRA IVANY: Okay.

STEVE HOUSER: The current enrollment at the university, which I'll define as three-quarter average full-time equivalent students -- there's about eight ways to count -- is 17,800 students. Our 2005 long-range development plan, which extends through 2020, is set for a pathway to 19,500 students. So, in theory, we could grow, per the plan, by another 1700-ish students through 2020. It doesn't mean we are going to. That was just sort of the plan.

Under that plan, we committed in an agreement to house -- create two bed spaces for every three students enrolled at the campus beyond 15,000. So to kind of put this in plain English, per the 2005 LRDP, long-range development plan, 4500 students could come. 15,000 to 19,5-, 4500, which means we had to deliver 3,000 extra bed spaces above a baseline number, which was 7,125. So by the end of the LRDP time frame, we have to deliver 10,125 beds. We have a little bit of time frame to deliver those beds in responding to enrollment. So our commitment year to get the 10,125 online is 2023 -- fall of 2023. That's the answer. So we need to have those beds in proportion to the enrollment.

Your question, I think, is a little bit different. It's not the one-to-one commitment with respect to the obligation that I am referring to. However, the total number of beds that we have been talking about is beyond for the number we have now, which is 9400 and 10,125.

SANDRA IVANY: I guess you are just throwing too many numbers out at me.

STEVE HOUSER: If you look at it -- if you look at -- well, let's just answer it quick, and then we need to move on with comment. But if you look at the trajectory of the growth of the past and if you stayed on that same trajectory, there would be more beds available than we would fill with new students. So it's both. It's new growth as well as existing students. But we don't know those numbers at this point.

SANDRA IVANY: You don't know if it is 80 percent new students, 20 percent existing?

STEVE HOUSER: We don't control enrollment.

JOLIE KERNS: But we do anticipate that some of the beds that we are providing will allow us to put a release valve on the existing housing right now.

SANDRA IVANY: Right. The numbers haven't been determined because you are not making the segue with admissions?

STEVE HOUSER: Right.

SANDRA IVANY: Why not?

STEVE HOUSER: It's important to go back to the point of this session, which is required by the state EIR process, and it's only to be at the beginning of the review process. We really need to focus on just this project. You've got great questions. It's just not -- this isn't exactly the right forum.

THE SPEAKER: Is this question time too?

JOLIE KERNS: These are informal questions and answers, and it is part of the EIR scoping session. We have a formal record for that.

NATALIA JACKSON: I may have missed this, but do you have current statistics on how many students are currently homeless and/or underhoused?

KEITH BRANDT: We can't answer that today.

ALISA KLAUS: So I think we need to focus right now on the project. We have a number of people who need to -- we can direct you to people.

NATALIA JACKSON: I just feel like when we are talking about -- I feel like it should be a part of the numbers --

KEITH BRANDT: That's outside of the scope of this project, unfortunately.

SABINA WILDMAN: When can we ask those questions? Because we are very much, like, in the dark in terms of these numbers of students on campus, as well as community members. So a lot us have these questions. So when can we ask them?

KEITH BRANDT: There will be a session once the developer is chosen and we have -- we have a project -- and we are going to be back here in the community presenting that. And that's the time to ask some of those questions. We can also schedule something special directly with you to talk about those things.

SABINA WILDMAN: Thank you.

KEITH BRANDT: We also don't have the experts here to answer your questions.

THE SPEAKER: I'm sorry. I missed the name of the EIR consulting company that was hired. Can we --

ALISA KLAUS: The EIR consult? Impact Sciences.

THE SPEAKER: Impact Sciences?

ALISA KLAUS: Right.

THE SPEAKER: And what do they specialize in or what's their purview?

ALISA KLAUS: We can talk to you about that separately. I don't think we have time really to get into the consultant's background. We need to focus right now, for the remaining time that we have, on the scoping comment portion of this meeting.

So who would like to -- who can -- who is ready to give a comment?

And this was -- Jim Snyder. This was -- Daniel Snyder's request to speak; right?

DANIEL SYNDER: That is correct.

ALISA KLAUS: Okay. So please state and spell your name.

JIM WARNER: My name is Jim Warner, W-a-r-n-e-r.

And my comment is just -- or my scoping request is that because of the grade on the site, bicycles can go really fast, and it's important to keep the bicycles separate from the cars, but it's also important to keep the bicycles separate from the pedestrians in the downhill direction. And I want to see the environmental impact report give careful consideration to those kinds of traffic flows.

ALISA KLAUS: Thank you.

Who is ready?

STANLEY SOKOLOW: Yeah. My name is Stanley Sokolow, S-o-k-o-l-o-w. And I live right here next to Moore Creek. And I wrote an e-mail to the project so they know the details of it, but I'd just like to add a little bit about that.

By adding more impervious surface up here, there's going to be more runoff into this Moore Creek watershed. And we've had problems in the past of excess flows came down Moore Creek and damaged our road and the banks of the Moore Creek. And we live right there and depend upon one street to enter -- our neighborhood, one year in 2000, we were flooded out. So I am concerned whatever new impervious surface -- some are going to be moved and some added. The net increase of impervious surface, all the runoff from that will be accommodated on campus, recharged into the groundwater so the off-campus flows don't exceed what they are now.

And the other concern I have is that living right next to the campus, I know intimately the traffic is a problem because there's only two roads in and out of the campus, and leaving the campus going down High Street or Bay Street at peak times, it's way backed up. So you are going to add more students. That's going to require more staff, support people, more service trucks, whatever. It's going to increase traffic.

So what mitigation are you going to make so that you can offset that by maybe having more bus service, free bus service for employees, or whatever?

So those are my two main concerns. Thank you.

ALISA KLAUS: Thank you.

DAN SNEIDER: My name is Dan Sneider. I am a member of the National Speleological Society. I volunteer with the Western Cave Conservancy.

And I want to preface my comment by saying I absolutely support building more housing on campus. It is a desperate need. I am a homeowner in downtown Santa Cruz. I see the impacts that the town faces by not having on-campus housing.

But I am a little bit concerned about the particular site chosen. Porter Meadow, as you all know, is underlain by karst. Empire Cave, which is the largest accessible cave on the campus property, is pretty much at the level of Cave Gulch Creek just below the meadow. And what I'd like everyone to understand is that a cave is merely the accessible portion or expression of a karst groundwater system.

Now, the reason that's important ecologically with Empire Cave, that that cave supports two endemic aquatic crustaceans. They are not found anywhere else. Arthropod and isopod. I think they are only identified as recently as the late '80s, actually. So it may be they complete their entire life cycle within the cave, which is outside the project area; it may be that they, during the winter, when the cave floods, wash in from the karst system under Porter Meadow and the rest of the campus; it may be that they migrate into the cave to complete part of their life cycle in the cave but require access through conduits from wherever that line of cycle begins.

And in the past, the university's treatment of the very extensive karst resources underlying much of it has been strictly from an engineering point of view. Gerry Weber has looked at the potential of using the groundwater as a water resource. It's posed an engineering challenge for quite a few buildings on campus. And I get that. Unfortunately, when I see the KEE-OS (phonetic) and 1415 study, it only mentions it in reference to being a geologic hazard right there in the middle of Porter Meadow. That's all great, but we entirely ignore the ecological component.

Also I've always been astounded, being an avid cave explorer -- I guess I am biased. I've always been astounded that the university doesn't consider this resource as an intellectual resource, as something that, just the spirit of curiosity that we all possess, would want to see, understand, and explore. But, again, it's always been seen as an impediment, as an obstacle, something to be ignored as much as possible.

Oh, yeah. Third, engineering facet that the university does pay attention to. It uses the sinkholes all over campus to dispose of storm water runoff.

THE SPEAKER: Uses what?

DAN SNEIDER: Sinkholes. Sinkholes are -- you know what a sinkhole is.

THE SPEAKER: Yes.

DAN SNEIDER: They can form in a number of ways. One of the ways they can form is through the collapse of underground chambers. This happens naturally.

But I can give you an example from the east meadow. The east remote lot -- and they are doing a much better job controlling this runoff now. There used to be a cave called Friday Night Cave, discovered in the late 1950's in the sinkhole that the gully leading down from the easternmost lot drains into. That hasn't been accessible for decades, probably because the runoff from that parking lot caused extensive gullying of the swale leading down into that sinkhole and probably filled it up with sediment. Who knows what biological resources were down there? Who knows what scenic resources were down there? Nobody wants to know because that would be inconvenient.

All I am asking is that this project provide for the proper study and understanding of the karst resources that are encountered during exploratory drilling for the -- you know, to determine the subsurface geology that design the foundations for these structures and mitigate appropriately.

But I'd like to see the resource regarded as more than just a threat to development plans. The problems can be mitigated.

I am in favor of more housing on campus, and I am even in favor of developing portions of this site. And it looks like you guys did redraw the boundaries to move them away from the cave. That's -- you know, but that's arbitrary. You don't really know what's under the surface yet, but you will.

So thank you for your time.

ALISA KLAUS: Thank you.

I'm sorry. Would you like to make a comment?

THE SPEAKER: Are you taping people's comments?

ALISA KLAUS: Yes. She is recording them. Yeah.

THE SPEAKER: Oh, I see. Just want to know. Good.

JAN HILKERT: I am Jan Hilkert, H-i-l-k-e-r-t.

My main concerns are traffic.

ALISA KLAUS: Can you come over here and speak just so she can hear you better.

JAN HILKERT: My main concerns are traffic and water supply. So not just water drainage and runoff, but how many wells are going to be drilled and how would that impact Bonnie Dune and the rest of the community?

ALISA KLAUS: Thank you.

Would you like to make a comment?

SANDRA IVANY: Yeah.

ALISA KLAUS: Can you come here so the reporter can hear you clearly. And get your name spelled first.

SANDRA IVANY: Sure. Here is my name.

My comment is very much like my question. I am just hoping that the next meeting that you have or the next information you put out, you could give a little bit more specific numbers of new enrollees, new students on campus.

You know, just the question I had, it seems that I've -- it's the second meeting I've gone to, and it's sort of like using the word the brunt of the housing would be used for new people. I think -- I am hoping that you can -- within this environmental impact, I think it is important to know how many new people are coming and how many -- you know, to understand those numbers.

Otherwise -- and I agree with the conversations we are having about water and bus systems and all of that, of course, but without knowing what -- without segueing with the admissions department, it seems that this is all, you know, just not specific enough. I just hope that you can bring somebody from admissions on the next part of the meeting. Yeah.

ALISA KLAUS: Thank you.

Is there anybody else who has an oral comment they would like to give? Okay.

STANLEY SOKOLOW: May I ask -- could I ask a question again?

JOLIE KERNS: Do you want to give an oral comment?

NATALIA JACKSON: Can I just read what I wrote? Is that okay?

ALISA KLAUS: Sure. Absolutely.

NATALIA JACKSON: I like to organize my thoughts in a written fashion.

ALISA KLAUS: So please just remember to say your name and --

NATALIA JACKSON: And I wrote it on here also.

My name is Natalia Jackson. I am --

THE SPEAKER: Louder.

NATALIA JACKSON: My name is Natalia Jackson, and

I am a fourth-year PhD student in mathematics at UCSC.

So the EIR is meant to consider the community as well as ecological impact. There's a lot of questions unanswered like, how does adding 3,000 beds and then increasing enrollment by more than that help the existing housing crisis in the county, which is partially due to enrollment levels which already succeed the sustainable carrying capacity of our community as a whole?

There are currently homeless students. Last year I spent four months homeless with a master's degree while working as a TA to continue in the mathematics PhD program as a single mother. While struggling to find a studio for under $2,000 a month, we considered a converted tool shed with no bathroom in Bonnie Dune for 1450 a month but couldn't come up with the 5,000-dollar security deposit.

THE SPEAKER: Jesus.

NATALIA JACKSON: I share the sincere concerns regarding the drastic ecological impacts of this project, and I hope that UCSC chooses to find a solution for the housing crisis which does not destroy the habitats and geological features in the area.

But regardless, before the university even considers increasing enrollment, the existing housing crisis must be addressed. How many students are currently unhoused or underhoused? How many faculty? Until these numbers are made public record, we have no way to intelligently assess whether this increase in housing is enough to even mitigate the current crisis.

Thank you.

LAUREEN WONG: I just have a question. And it's partly because I --

ALISA KLAUS: Can you -- let me just make sure that we -- do you have a question about this scoping process?

LAUREEN WONG: Well, yes. I don't know if it's in the scoping because I haven't seen the proposal. So that's why it's a question.

Does it, anywhere in this proposal, talk about -- since this is a public-private partnership -- so the public part, obviously, since it's university land, but the private part is it's being built by private companies.

How does that work out in terms of cost for whoever wants to move into -- because it's going to be a different landlord; right? For an apartment -- so are the apartment costs going to be regulated by the university or does the university have any control over the cost of that on-campus housing?

JOLIE KERNS: Yeah. I think the rental rates remain the same throughout the system.

LAUREEN WONG: So they will be decided by the university. So there won't be any price difference between the existing and future admittance?

JOLIE KERNS: I don't know that -- they are regulated and discussed with the developer, and there's not an increase in -- we are keeping kind of a cap on that. So is that --

LAUREEN WONG: So the university is able to control the cost?

STEVE HOUSER: Yeah. It would be agreed upon. And the goal is to have the new housing work seamlessly with the existing housing so that there isn't sticker shock going from one year to the next but rather have it all logically flow. The agreements aren't penciled yet, but that's the spirit of what is planned to happen.

KEITH BRANDT: Our goal is not for -- the students not to necessarily know that there's a private party involved. That's what Steve means by "seamless." The students, they are going to pay their fees to the university.

LAUREEN WONG: They won't know.

KEITH BRANDT: Who is running it. Yeah.

THE SPEAKER: So is the university responsible for the cost, then?

STEVE HOUSER: So there's a lot of nuance to this, but to -- the residential components, most of those components will be university-supported. That's the concept there. There's a lot of detail that needs to be worked out. So I don't know if it's really the best use of this meeting to talk about pages and pages and pages of agreements that need to happen.

LAUREEN WONG: I just wanted to get a sense of how that was going forward.

STEVE HOUSER: Sure.

MICHAEL WONG: Well, it sounded like the university was going to become the middleman between the student housing students and the private investor.

ALISA KLAUS: Can we maybe make sure that there's nobody else who wants to give a comment on the scope of the EIR, and then perhaps those people who have additional questions, if they want to ask of the university staff, could stay and do that.

So is there anybody else who would like to give a comment that will be reported?

ANGELA HARRIS: My name is Angela Harris. I am an alumni. And my concern is about the two federally listed endangered species that are located on the campus, so, like, the California red-legged frog and the Ohlone tiger beetle.

My concern is that with the amount of time being allowed to do the EIR -- it sounds like between maybe

October -- and if the final is going to be done in January, then that's about three months of study time, and I am not sure that that's enough time to really study plant or animal species' migration patterns because those take place over a full annual cycle. Or hydrology.

So I guess my comment is that I think that if there are preliminary studies or surveys that have been done, those should be made available to the public. And otherwise I am just not sure how we can possibly study, you know, migration or habitat numbers or -- I'm sorry -- population numbers or habitat patterns with only such a short time frame.

ALISA KLAUS: Thank you.

DIANA ALFARO: Hi. My name is Diana Alfaro, A-l-f-a-r-o. I am an alumni and a developer.

So my question is, one of the scoping elements here is esthetics of the building. So where is the design? Because if it's going to be done in January, it would be nice to actually look at the design and comment on the design or have the possibility to comment on the design because that is one of the things that is being considered as part of the EIR.

ALISA KLAUS: Okay.

DIANA ALFARO: Thanks.

ALISA KLAUS: We can talk about that later.

THE SPEAKER: All right. Okay.

STANLEY SOKOLOW: So seeing no one else who wants to make a formal statement, can I address a question back again?

ALISA KLAUS: We have a few more minutes.

STANLEY SOKOLOW: Stanley Sokolow.

This is just to capsulate what you said about the number of beds and enrollment, and so on.

So what I read someplace else is roughly 900 of these 3,000 units, beds, are gonna be to accommodate loss of the family student housing beds. You know, some of those will be replaced by those 900. And the others are to alleviate excess crowding, the quads be spread out again. Lounges will come back, and so on. And the other 2100 were there for the new students.

So since the university, I think, has an obligation to house 55 percent of the students on campus -- something like that. The number may be wrong. But for the 2100 students on campus, that would mean there's maybe 1800, 1900 students that will be off campus potentially when the enrollment is filled out.

Is that right?

STEVE HOUSER: Yeah. So I think what we are struggling with is we are talking about a bed space delivery, and then enrollment is -- again, to reiterate what Keith said, is not controlled by any of us or even the campus. It's state-mandated.

STANLEY SOKOLOW: Right. But it will give the campus -- the university system the capacity to raise enrollment that much because now you'll be able to accommodate them. So you are building a capacity to increase the enrollment whenever the university says to increase it. I am just trying to find out how many of those potential new students would therefore be looking for housing off campus.

STEVE HOUSER: Not necessarily new students. It's some of our existing students that are going in.

JOLIE KERNS: There's a lot of demand of juniors and seniors. There's not a lot of living options on campus right now for them. Our colleges have kind of first years and continuing students, second years, but when you get to the junior-senior level, there's not a lot of options on campus. So that's one demand that we've seen.

So the beds that we are providing are as much for existing students that are living out in the community right now that want to live on campus as potential new students that would be coming, but there's not a direct relationship to the beds that we are providing right now to future growth, if that.

STANLEY SOKOLOW: But that's only in the short run because you only promised students two years of housing on campus. So eventually the juniors and seniors will be told you have to live off campus because we now need these on-campus beds for new enrollment and first and second students.

JOLIE KERNS: No. They can live in these beds. Anyone can live in --

STANLEY SOKOLOW: They can, but when you get to the enrollment, the, you know, 22,000 or 27,500, or whatever the ultimate size of the campus is, these beds --

JOLIE KERNS: You are saying we'll need these beds to --

STANLEY SOKOLOW: You are going to need these beds for the new freshman.

STEVE HOUSER: Or we would need additional beds beyond these beds. And we are not saying this is the end-all-be-all for projects.

STANLEY SOKOLOW: So I'm just trying to ask, the capacity of this project will allow the enrollment to increase such that there will be roughly 1800 or so more students looking for housing off campus.

STEVE HOUSER: If you put this in the big-picture perspective, we've got about 9500 beds on campus now. We are adding 3,000. So a third of what we've got now, we are adding more. If you compare that to the City of Santa Cruz, they've got about 400 beds planned for the whole city. So we feel like we are trying to really make an impact here.

Now, you are right. We don't know how much of that will be eaten up over the years, but this is a huge project.

STANLEY SOKOLOW: It's going to be big, but will it allow the -- you know, the university system to say now you have the bedding, the bed capacity, so you can increase your enrollment by the year 2022 to be 21,000 students?

KEITH BRANDT: Not necessarily.

STEVE HOUSER: Yeah. I wouldn't --

STANLEY SOKOLOW: But they would allow them to do that. They won't necessarily say that.

KEITH BRANDT: Every campus in the University of California system is focused on housing right now. Everybody is building housing because we are so crunched, and California is going through a housing crunch.

JOLIE KERNS: We do have a demand that exists right now for those 3,000 beds. And I understand the anticipated --

STANLEY SOKOLOW: When the enrollment is forced on you and you have to increase the enrollment, you have built capacity to put 1800 more students in the city by building out this project.

JOLIE KERNS: I don't understand. Yeah. I am not sure I understand.

STANLEY SOKOLOW: Well, don't you have an agreement with the city that you are obligated to house 55 percent or something like that?

MICHAEL WONG: 67.

STEVE HOUSER: I think you are saying that the decision to add enrollment is made based on housing capacity. But one could flip that around and say, well, we increased enrollment without building a bunch of new beds as well. So, I mean --

MICHAEL WONG: Which is what you have done already.

STEVE HOUSER: So we've increased bed spaces by increasing density with an existing structure. So double bedrooms have become triples. Lounges have become quads.

LAUREEN WONG: But the issue -- I think the issue is not -- is not so much that which comes first but the fact that increasing enrollment has impacts on the city for services whether they are living on campus or if they are living in the town. But obviously West Side is impacted by increasing enrollment whether they are driving through the neighborhoods or parking in the neighborhoods or they are living on campus.

MICHAEL WONG: Or they are in the frat houses.

LAUREEN WONG: You have to have teachers to teach those classes. You have to have services to feed and house those students, and the increase in students has a direct impact on services and traffic and parking, and so that's really --

MICHAEL WONG: Just the quality of life in Santa Cruz on our side, the West Side --

LAUREEN WONG: Or sewer or runoff, or whatever. So I think that's a concern, whether the enrollment is driving the -- is driving people living on campus or off campus -- that there's a definite impact. I am really seeing it increasingly.

JOLIE KERNS: Yeah. There will -- I mean, 3,000 beds on campus -- yeah. It's --

MICHAEL WONG: We are 30-year residents of West Side. Okay? We have seen a dramatic change in the last ten years. It's gotten to a point now, we can't even get out of our driveway. I live on Western Drive. I can't even get out of my driveway on most days. I've got people racing down High Street. I've had a meeting with the Chief of Police with regard to traffic and traffic enforcement in and around the campus, which I was clearly told last year, "We don't enforce around the campus. We don't have the time." Okay? That attitude has changed as of now with the new deputy, the new chief, but that's one of the reasons I've talked to Brian with regard to what can be done to manage the local community immediately around UCSC such that we get some of our civility back to the neighborhood. Because it's a racetrack. It is a garbage dump and a racetrack right now.

STEVE HOUSER: There is a partnership now between the campus police and the city police, and I think they need to hear a little more about this.

MICHAEL WONG: Yeah. I'd love to -- I'll e-mail you the package I sent to the -- on our meeting with the chief with regard to what needs to be done, what we think needs to be done, and specifically on Western Drive, traffic calming, because we've got semis coming up the street delivering to UCSC. We've got people racing at night on High Street. Every night you can hear them zooming up. Once they get past Bay Street, you can hear them scream up High Street. Western Drive is the same way. That traffic speed translates itself directly onto Western. We've got idiots, as far as I am concerned, with the City Planning Traffic Department that have marked Western Drive with a passing lane. Supposedly 30 miles an hour is supposed to calm traffic on Western Drive. It has not. It has only encouraged speed on Western Drive. And anyone who lives on Western all the way from the top of Western all the way past, say, Western Court will tell you the same thing. It's become unreasonably dangerous to walk the streets in that area.

THE SPEAKER: Tell the regions to fund more little vans.

DAN SNYDER: I really do appreciate the concerns of the neighbors of the university. I mean, this is one reason why I think ultimately the idea of an entrance in Pogonip is going to have to be visited despite that public open space because really the folks on High Street and Western are suffering, and it's just going to get worse.

And that is not what this project is about. This project is part of the solution. Okay? This project is to try to keep more students on campus more of the time. All right. The state mandates enrollment levels. You can't block a housing project. You can't block proper planning efforts in the mistaken belief that you are going to force a bottleneck on enrollment. You are not. The university is going to grow. We are stuck with that. That's not going to change. And if you want it to change, you are speaking to the wrong people and you are addressing your comments to the wrong meeting. You should be talking to your legislators.

STEVE HOUSER: So we need to close the

official -- this meeting officially. We are going to stick around and hear your comments and answer questions as best we can. It's helpful to hear your feedback even though it doesn't necessarily apply directly to this project. But we thank you for coming tonight.

(A recess was taken.)

SABINA WILDMAN: My name is Sabina Wildman, and I am a third-year on campus, and last year I was a residential assistant, meaning I lived in with students and was a kind of like community builder in that space.

And the impact that taking away lounges has had on the community is very, very real, and it's not okay because students do not have space to study, to spend time with each other, to socialize, to relax indoors in their building communities. And on top of that, the triples, they are -- what used to be doubles are now triples. So three people are crowded into small rooms. And now this year lounges that were having four people or were planned to have four people in them at Merrill College now have six students in an old lounge. Six students in a small space is not okay for anyone, for their mental health, for their social ability for their movement. And as an RA, we saw the impact of that with mediations, with roommate conflicts. And there's also a lack of wiggle room in terms of having, like, roommate changes when there are issues. So not only that, but the impact on the residential community, which UCSC prides itself in because of -- the college system is really, really great and real. And with this new housing, it's very clear that as enrollment continues to increase, the same thing will happen. Lounges will be taken away, these new lounges, and it is going to continue this whole cycle.

So adding this extra, like, housing is clearly going to have a negative impact on the students because it's not going to keep the students' health or mental health or academics or anything in mind, because if you are keeping the students out of the entire picture and then you don't want the students to know this is a public-private partnership, that's pretty important because the students need to have transparency with the admin to know what's happening.

We have been kept out of the loop. There's very few student representatives that has been on this planning committee besides, like, one student, as far as I know, that was sitting on this. But there are very few options for us to work with you, and you just report back and barely listen to us when we do say things.

So I want to know where student agency can come into place in this model because UCSC prides itself on student agency, as well as a history of questioning authority, which it seems like we are being repressed in our voices right now, because we are not happy with these buildings coming over here, and neither are the animals, and neither is the landscape. Like, UCSC -- like, this hill was not made to fit this many students. And for you to continue to crowd in students into the space is unfair to students. It's unfair to local community people because clearly the traffic is impacting everything, just impacts from the inside out.

So within the residential communities and the libraries and the dining halls, there's not enough space. Students are being overcrowded. There is going to be a bigger impact on mental health capacities. Already there's a bigger impact on classrooms. We don't have enough class space. They had to change our schedules last year because they couldn't fit us in all the classrooms in all the time that we have for a day. More classes are online because of this.

We are being stripped away of our education. We are still having to pay more for tuition and for housing. And as you mentioned earlier, where is the gap or where is the cutoff? Because there's no ceiling on the price of you raising the price of housing. Yeah. Maybe you are going to work with other UCSC housing, but that's already a service that is going to be increasing too. There's no path on that. There's no regulation. There's no check. Students have no voice in that. You can keep raising housing prices without students having any impact on that, any voice on that.

So basically this is not helping students. This is not helping community members. This is helping the public-private partnership and this corporation. So I think you all need to take a look at this, listen to students more, and maybe realize this isn't a good idea and you are just adding to the problem and you are going to have to keep doing this years and years to come.

So that's my opinion.

JOLIE KERNS: Maybe we can talk about some of those issues. I think that was really great to kind of hear your voice. There has not been any intention to hide any kind of public-private partnership. So we have some of our partners here in the room tonight just kind of listening in.

So this is new for the university to take on. Part of what we are doing really is trying to relieve the lounges that are being kind of doubled up or tripled up.

SABINA WILDMAN: When are they going to be back by? What's the date in the plan they are going to be back?

JOLIE KERNS: We have beds being delivered in

2020 on a really fast schedule. That sounds far. It is a really fast schedule for construction.

SABINA WILDMAN: 2020, the lounges will be back?

JOLIE KERNS: Some lounges will be back.

SABINA WILDMAN: So, like, some?

JOLIE KERNS: I don't know the numbers, but we are working on it.

SABINA WILDMAN: If you had the numbers, that would be great. The students need to know. Because we deserve that. We are paying for housing. You know what I am saying?

ALISA KLAUS: So I think we need to kind of be sort of -- unless there is somebody else who wants to give a formal comment, then we need to end the meeting, and then we can continue to have some informal conversation.

THE SPEAKER: I think this is great to make it more inclusive.

ALISA KLAUS: We need to tell the court reporter when we are done taking scoping comments on the environmental impact report.

Would you like to make a comment?

LAUREEN WONG: I just wanted to respond to -- really quickly. And just two personal experiences that I want to relate that may be valuable.

One, when I was at UC Davis in 1974, they were undergoing the same problem, and they were putting students in lounges. And so that is not a new strategy. That's a very old strategy.

And the second thing is recently we had a nephew attending UC Santa Cruz, and he was placed in Oaks College. And as you know, that's over on the West Side near where this housing is. And the transportation on campus was inadequate. And so many times, since he was a computer sciences student, they would walk in the rain 25 minutes to the center of campus to get to class, and then they would have to walk back because the buses were jammed and there weren't enough buses. That is a transportation issue. And as a freshman, of course, they are not allowed to have a car, and they cannot park on campus, even if they want to, and there's inadequate parking anyway.

So those were my only two comments.

CAMILLE ADDLEMAN: My name is Camille Addleman, and I am a fourth-year undergrad at UCSC.

Everything Sabina said, I highly agree with. I think that this housing project is a Band-Aid, per se, to a much larger issue.

To keep it short and sweet, in the past 20 years, there have been 20 prisons built and one university. If we are trying to accommodate more students in the higher education system, then we need to build more schools, not try to cram more students onto tight campuses with limited resources.

Thank you.

ALISA KLAUS: Thank you.

Any more comments before we break up and as we will be here to sort of continue informal discussion?

SANDRA IVANY: This is not exactly an environmental comment, but listening to the two students, I would agree that it would be great if you could publicize these meetings in a more widespread manner on the campus to include students in these conversations. They are paying a great deal of money for their education, and they just highlighted something that is very sad about this, and it is about our whole government, is that this can be viewed as more of a partnership between the larger entities and not really in the students' best interest for all the money they are paying for school. So I would like to see, as part of this environmental review, more students. And I know that will complicate things for you because students will have a lot of very compelling opinions, but I would like to see that happen as a community member.

JOLIE KERNS: Thank you.

SANDRA IVANY: I appreciate their voices.

JOLIE KERNS: We want their feedback.

SANDRA IVANY: So they need to know about it, you know. There's only two that came. Two or three or four. Maybe it's not well-known enough.

ALISA KLAUS: So, in closing, here is -- on the handout, there is information about where you can send written comments, and there's also the URL for a website for the project, and you can sign up on that website to receive updates about the project itself, not just about the environmental CEQA document. If you want to be on our CEQA mailing list, then you should sign up on that, the sign-up sheet that is on the table back there.

(Meeting concluded at 8:11 p.m.)

--oooOooo--

STATE OF CALIFORNIA)
) SS:
COUNTY OF SANTA CRUZ)

I, Cary Blue LaTurno, hereby certify that I was present and took down correctly in stenotypy to the best of my ability all the testimony and proceedings in the foregoing-entitled matter; and I further certify that the annexed and foregoing is a full, true, and correct statement of such testimony.

Dated at Santa Cruz, California, on October 6, 2017.

Cary Blue LaTurno

Cary Blue LaTurno

CSR No. 9681

SECOND NOP (NOVEMBER 2017)

UNIVERSITY OF CALIFORNIA, SANTA CRUZ

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PHYSICAL PLANNING AND CONSTRUCTION | SANTA CRUZ, CALIFORNIA 95064

October 31, 2017
State of California
Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814

2nd REVISED NOTICE OF PREPARATION: DRAFT ENVIRONMENTAL IMPACT REPORT
SCH# 2017092007

Lead Agency: University of California

Project Title: Student Housing West Project

Project Location: UC Santa Cruz main campus, Santa Cruz (Exhibit 1)

County: Santa Cruz

The University of California will be the Lead Agency and will prepare an Environmental Impact Report ("EIR") for the project described below.

On April 10, 2017, the University of California, Santa Cruz Campus (UC Santa Cruz) issued a Notice of Preparation (NOP) for an EIR focused on an amendment to the UC Santa Cruz 2005 Long Range Development Plan ("2005 LRDP") to support the future development of student housing in the western portion of the UC Santa Cruz main campus. The NOP was issued in accordance with the State CEQA Guidelines (14 California Code of Regulations [CCR] Section 15082) with the intent of informing agencies and interested parties that an EIR would be prepared for an amendment to the 2005 LRDP land use map that would support the future development of a 3,000-bed student housing project on the campus. As was noted in that NOP, that EIR was planned to be a Subsequent EIR (SEIR) to the previously certified UC Santa Cruz 2005 Long Range Development Plan EIR (SCH #2005012113) and was expected to evaluate and disclose the programmatic impacts that could result from the approval of the proposed LRDP amendment.

On August 31, 2017, UC Santa Cruz issued a Revised NOP for a project-level EIR to evaluate and disclose the environmental impacts from the construction and operation of the Student Housing West project. The Student Housing West project consists of the construction and occupancy of up to 3,000 new beds of student housing for upper division undergraduate students, graduate students and students with families, including support spaces, amenities and associated infrastructure. As described in the Revised NOP, the entirety of the project would be constructed on the west side of the UC Santa Cruz main campus, west of Heller Drive and south of Kresge College.

UC Santa Cruz is now proposing to develop a portion of the project on a different location on the main campus. The housing for undergraduate and graduate students, including support spaces, amenities and associated infrastructure, would still be developed on the west campus, on the site west of Heller Drive which was identified in the August 2017 Revised NOP. However, the housing for student families would be constructed on a 20-acre site in the southeast corner of campus, at the northeast corner of the intersection of Coolidge Drive and Hagar Drive Exhibit 2). The development of housing at this location would require an amendment to the 2005 LRDP to change the land use designation of the site from Campus Resource Land to Colleges and Student Housing.

The University is issuing this 2nd Revised NOP to notify public agencies and the public of this change to the siting of the proposed development and to request input regarding the scope and content of the Draft EIR in light of this modification of the project.

Background: The proposed project supports the UC system-wide Housing Initiative, which was announced by UC President Janet Napolitano in January 2016. The overarching goals of the housing initiative are two-fold: first, to ensure that each of UC's campuses has sufficient housing for its growing student populace; and second, to keep housing as affordable as possible for UC students.

The 2005 LRDP, which was approved by the UC Regents in September 2006, provides a comprehensive framework for the physical development of the UC Santa Cruz campus, to accommodate an on-campus 3-quarter-average enrollment of 19,500 students, or an increase of approximately 5,100 students from the 2003-04 baseline.

The 2005 LRDP includes a building program to accommodate UCSC's academic, research, and public service mission as enrollment grows, and a land use plan that assigns elements of the building program to designated land-use areas and describes general objectives that will guide development within those areas. The building program identifies a total of about 3,175,000 gross square feet of building space, including 1,196,000 gross square feet of student and employee housing.

The land use plan assigns the land use designation Colleges and Student Housing (CSH) to 288 acres of land to the east, north, and west of the academic core. This land use designation accommodates the construction of new colleges, expansion of existing colleges through infill, new undergraduate and graduate student housing, and family student housing projects.

The 2005 LRDP identifies on-campus housing targets of 50 percent of undergraduate students and 25 percent of graduate students. Thus, the 2005 LRDP EIR evaluated the addition of 2,300 student beds to the inventory of 6,891 beds existing in fall 2004, for a total of 9,190 beds.

As part of a 2008 Comprehensive Settlement Agreement that resolved lawsuits by the City and County of Santa Cruz and nine citizens, the University agreed that UC Santa Cruz will provide housing to accommodate 67 percent of new-student enrollment within four years of reaching that enrollment. At a total enrollment of 19,500, UCSC would need to have university housing available for 10,125 students, which would be 935 more beds than analyzed in the 2005 LRDP EIR. In addition, as part of the Settlement Agreement, the University agreed that housing development in the area west of Porter College will be initiated before development of new bed spaces in the North Campus area.

The Student Housing West Project would construct approximately 2,900 student beds west of Heller Drive (Heller site), and 125 to 150 units of housing for student families northeast of the intersection of Coolidge Drive and Hagar Drive (Hagar site). The development of student housing on the Hagar site would require an amendment of the 2005 LRDP to change the designation of approximately 20 acres of land from Campus Resource Land to Colleges and Student Housing. The project would be constructed in phases with the first phase available for occupancy by Fall 2020 and the remainder of the project to be completed by Fall 2022. These new beds would enable the Campus to eliminate some overflow beds in existing housing, and to meet its commitments under the Settlement Agreement.

Environmental Review and Comment: The EIR for the Student Housing West project will be a project-level EIR focused on the environmental impacts from the construction and operation of the proposed project. As appropriate, the analysis will be tiered from the analyses contained in the previously certified UC Santa Cruz 2005 Long Range Development Plan EIR (SCH #2005012113). The EIR will address all of the issues identified in Appendix G to the CEQA Guidelines, that is: aesthetics, agricultural and forestry resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, utilities and service systems. As a project-level EIR tiered from the 2005 LRDP EIR, the EIR will rely on the cumulative impact analysis contained in the 2005 LRDP EIR. However, because the Santa Cruz Superior Court determined the 2005 LRDP EIR's analysis of water supply and population and housing impacts to be inadequate and directed the University to supplement those analyses, the Student Housing West Project EIR will include a supplement to the 2005 LRDP EIR that will provide an updated analysis of the cumulative impacts of campus growth under the 2005 LRDP on water supply, and population and housing. It will also include an analysis of impacts related to greenhouse gas emissions that would potentially result from the remaining campus development under the 2005 LRDP.

In compliance with the State and University of California guidelines for implementation of CEQA, this NOP is hereby sent to inform you that UC Santa Cruz is preparing a Draft EIR for the above-named project. As Lead Agency we need to know the views of you or your agency as to the scope and content of the environmental information that is germane to you or your agency's statutory responsibilities, if any, in connection with the proposed project.

UC Santa Cruz requests input regarding the scope and content of the Draft EIR that is relevant to you or your agency's statutory/regulatory responsibilities or is of interest to interested individuals, to ascertain potential environmental impacts of the project. Responses to this NOP are requested to identify: 1) the significant environmental issues, reasonable alternatives, and mitigation measures that should be explored in the Draft EIR; and 2) whether your agency will be a responsible or trustee agency for the project.

We appreciate your prompt acknowledgement and review of this NOP. Due to the time limits mandated by state law, your response must be sent at the earliest possible date, but not later than 30 days after receipt of this notice.

COMMENT PERIOD: Written comments on the NOP can be sent anytime during the NOP review period which begins November 1, 2017 and ends November 30, 2017 at 5:00 PM. Please send your written or electronic responses, with appropriate contact information, to the following address:

Alisa Klaus
Senior Environmental Planner
Physical Planning and Construction
University of California, Santa Cruz
1156 High Street
Santa Cruz, CA 95064

eircomment@ucsc.edu

INFORMATION AND SCOPING SESSION: Written comments on the NOP may also be provided at an information and scoping session to be held on Wednesday, Nov. 29, from 6:00 pm to 8:00 PM at Oakes College Academic Building, Classroom 105, on the UC Santa Cruz campus.

If you have any questions regarding the NOP or the information and scoping session please contact Alisa Klaus, Senior Environmental Planner, at (831) 459-3732.

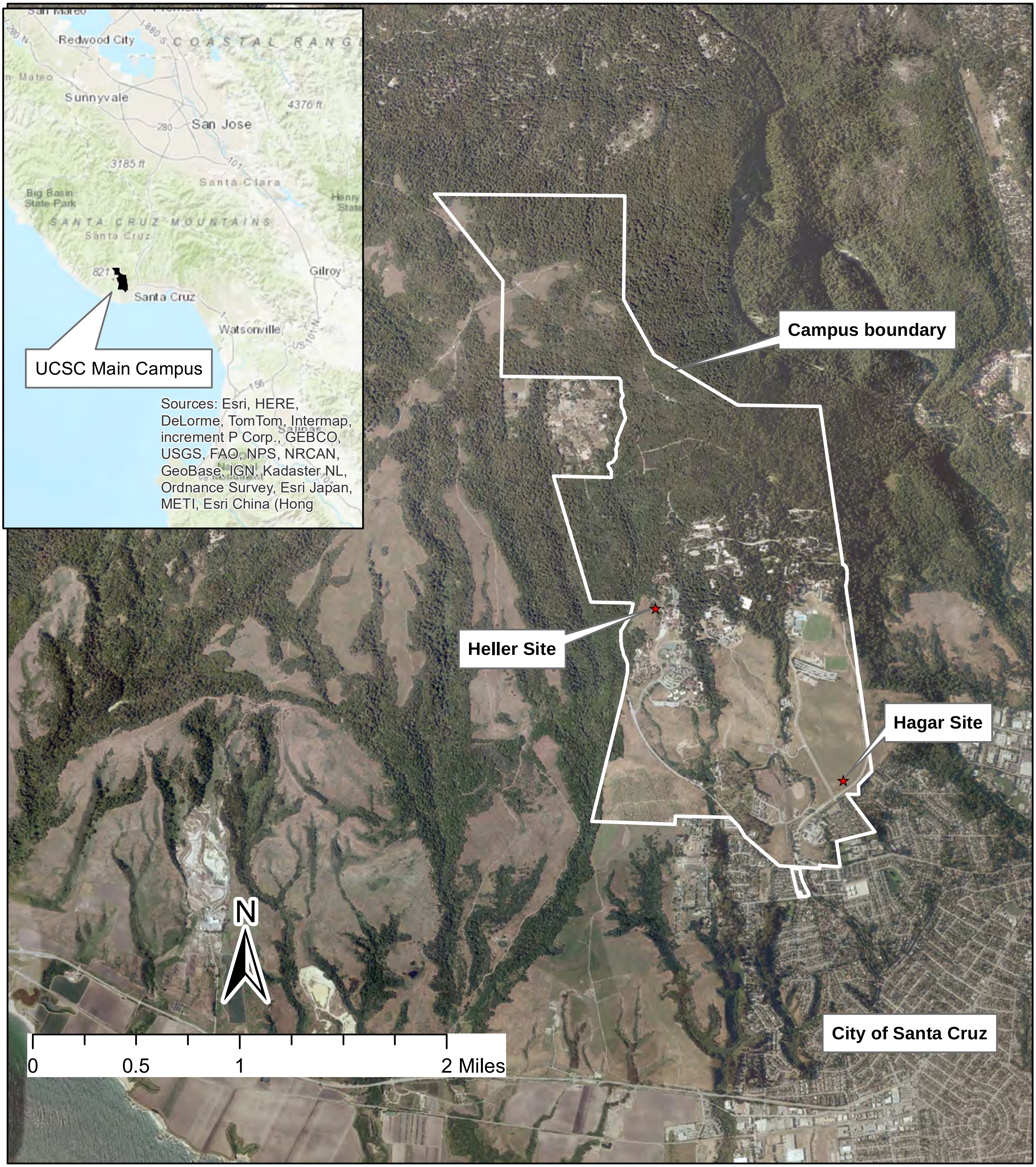

Exhibit 1: Project Location

Student Housing West Project
EIR Notice of Preparation
October 2017

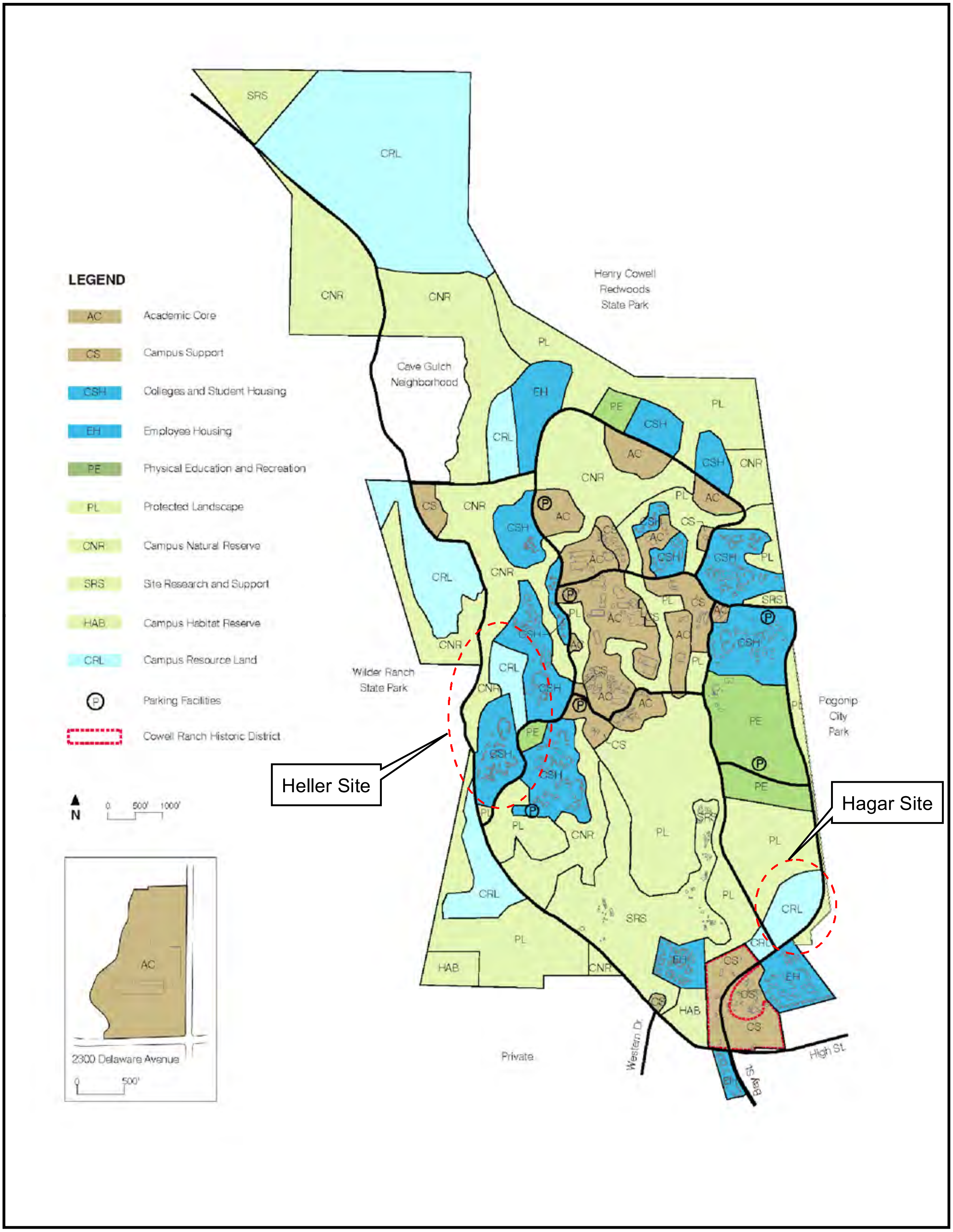

Exhibit 2: Project Sites

Student Housing West
EIR Notice of Preparation
October 2017

COMMENTS

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Comment on Student Housing West Project

1 message

Diana Adamic <adamic@me.com> Thu, Nov 30, 2017 at 4:39 PM
To: eircomment@ucsc.edu

Thank you for the presentation on Nov. 29. Very informative.

I would like to see a lot less parking. Students in dorms do not need private cars. We should be encouraging them to use the buses passes they get with their student IDs as well as the “city cars” such as ZipCars around campus. Transportation will be changing a lot in the next 5-10 years and we should not create a design now that will be obsolete in 10 years.

If parking is a must then please design the parking lot so that in 5 years the spaces for cars can be removed and new sleeping spaces added.

PLEASE!! Consider creating real bike parking. A large cage that is well lit, easy access for owners and safe for bikes. Denmark has these as a mandatory requirement in all apartments.

Diana Adamic

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] housing west

1 message

Erik Borrowman <elborrow@ucsc.edu> Tue, Nov 7, 2017 at 11:17 AM
To: eircomment@ucsc.edu

do not do any more housing building with out bringing the Eastern access to the table.
the west side neighbors are very tired of gridlocked streets because of the piss poor planning this campus has done.
thanks
Erik

Google @ UCSC

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Support for housing plan

1 message

Claire <hatcher@cruzio.com>
To: eircomment@ucsc.edu
Cc: Robert <hatcher@cruzio.com>

Tue, Nov 28, 2017 at 7:28 AM

Hello,

My family has lived on the westside since 1984 when the enrollment at UCSC was 6-7,000 students. Families and working adults who were long term residents filled our neighborhoods and finding housing, although challenging, was not impossible. Now we have whole blocks with too many of the homes occupied by short term residents and students. Is UCSC a community asset if it weakens our neighborhoods?Our working professionals, teachers, staff, business people can't find homes because realtor/landlords make more money filling them with students. It becomes a cycle, with real estate investors (some from out of town) purchasing homes they know they can rent for maximum profit. Working families and couples can't compete.

UCSC must use its beautiful land and financial resources to house it's students. Growing larger without a way to house students is just irresponsible to our community. Temporary residents and tourists should not overtake our supply of family homes. Students should largely be housed on campus and tourists should stay in hotels.

So to the UCSC housing plan, we say, "Yes please!! With seconds!"

Sincerely,
Claire Castagna
Robert Hatcher
139 Peyton Street
Santa Cruz, Ca 95060

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Campus housing and traffic

1 message

chanman <chanman215@comcast.net> Tue, Nov 28, 2017 at 8:26 PM
Reply-To: chanman <chanman215@comcast.net>
To: eircomment@ucsc.edu

To whom it may concern. I've lived on Storey st for 37 yrs. Frankly i am tired of the traffic coming down my street and backing up half up high street. Those idling cars aren't doing anything good for our(my) quality of life. When I first bought the house there was much talk of an eastern access route thought the pogonip. It is needed> . My street should not be carrying the burden of so much backed up traffic on schools days. Mission street is a mess, worse than ever with many of the turn offs now closed between Bay and Laurel.(Thanks public works) What is your traffic plan? PS Have you ever considered building a satellite campus in Watsonville where the land is cheap and the economy is depressed. I might be more cost effective. Thanks , Greg Chansky 831 5668939

Alisa Klaus <aklaus@ucsc.edu>

EIR Scoping Period Timing

1 message

Chayla Fisher <chlfishe@ucsc.edu> Mon, Nov 27, 2017 at 10:02 AM
To: aklaus@ucsc.edu

Hello Alisa,

My name is Chayla Fisher and I am a second year ENVS and Legal Studies double major. I am very passionate about the environment and UCSC's ecology so I have been closely following the West Campus Housing Development plans. I understand that there has been a recent change in the planned location for the housing development and was wondering if a subsequent Environmental Impact Report will be created for this area.

To my knowledge, there was a planned period for comment this month, then the report was meant to be created throughout December, with another comment period following the release of that document. Will this still be happening over the next couple months or has this been pushed back at all due to the change in location? I would just like to know when to keep an eye out for more information regarding this project.

Thanks!

Best,
-Chayla Fisher

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Alumni in strong support of 3,000 beds!

1 message

Norma Guzman <normaguz@gmail.com> Wed, Nov 8, 2017 at 8:47 AM
To: eircomment@ucsc.edu

Hi Alisa,

Thank you for your public service! I was excited to read that UCSC is planning to add 3,000 more beds to its campus. I used to be a UC student and shared a converted triple room with two roommates who went to sleep much later than I did. I had to wake up early to go to work and wish that I would have had better housing options to make my transition into college a little smoother.

While I have not seen renderings of any proposals yet, I would STRONGLY suggest taking measures to ensure the safety of students and staff:

- Build vertically, on LESS land so as to prevent the sprawl of impermeable surfaces that encouraged flooding in Houston
- Build vertically, on LESS land to protect structures against fire damage spreading as in the case of the North Bay fires
- Build vertically, on LESS land to protect irreplaceable wildlife habitat
- Encourage cycling by placing dedicated lanes ADJACENT to curbs, with protective vertical buffers
- Wide sidewalks and narrow streets to encourage walking, cycling, transit and lower carbon emission modes. We have taken streets for granted. We can do better than using public space to store private cars.
- Consider using rooftops for habitat-friendly plantings

I look forward to hearing about the next steps in the process!

Thanks!

Norma Guzman

831-596-6578
UC alum 2005 & 2014

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Yes on EIR

1 message

Dennis Hagen <hagensipkin@gmail.com> Tue, Nov 28, 2017 at 8:47 AM
To: eircomment@ucsc.edu

UCSC needs this housing.
Finalize the EIR and let's get more housing on campus!
Dennis Hagen
Santa Cruz

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eircomment mailing list
eircomment@ucsc.edu
https://lists.ucsc.edu/mailman/listinfo/eircomment

Google @ UCSC

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Comment re: NOP issued 10/31/17

1 message

Angela Harris <composted@gmail.com> Thu, Nov 30, 2017 at 3:14 PM
To: eircomment@ucsc.edu

Hello,

I would like to submit comments regarding the proposed relocation of Family Student Housing at UCSC to the Hagar/Great Meadow site.

I have a few concerns:

1) Coastal prairie meadow hosts incredible levels of biodiversity in terms of plant and animal species. In California, coastal prairie has vastly shrunk from its former range, and it is therefore becoming increasingly rare. This makes it extremely important to preserve remaining coastal prairie, which the Great Meadow at UCSC constitutes. I would like the EIR to include a comprehensive vegetation survey to study what plants currently live at the site. No rare species should be compromised.

2) Archaeologically, meadows in this area are often found to have remnants of the Amah Mutsun Tribal Band peoples and village sites. It is of the utmost importance not to lose or disturb resources that are culturally relevant or valuable to the Tribe. As colonizers, we have a moral duty to minimize further destruction of indigenous people's land and heritage. Therefore, consultation with the Tribal chairman Valentin Lopez as well as a comprehensive archaeological survey would be appropriate.

It would be great if any surveys related to this EIR could be made available to the public online.

3) The Hagar site proposed for development is close to an area near faculty housing that is currently protected as habitat for the federally endangered California Red Legged Frog (designated as HAB on the LRDP maps). Given that frogs have been known to roam over 2 miles (see p. 17 of https://www.fws.gov/sacramento/es/survey-protocols-guidelines/documents/crf_survey_guidance_aug2005.pdf), the Great Meadow site likely encompasses Red Legged Frog territory, which would make it unsuitable for development under CEQA/the Endangered Species Act. Careful study would need to be done in order to accurately survey and observe the area for any signs of any life stage of the frog.

4) I would like campus planners to explore alternative sites for this development. Aesthetically, development over the Great Meadow is an eyesore at the entrance to campus.

5) I also do not think it is appropriate from a biological standpoint to pave over coastal prairie in order to construct parking spaces.

5) I also suspect that noise from construction would impact birds and mammals (hawks, bobcats, foxes, etc.).

6) Also, geologically, the land underneath the Great Meadow may not be able to bear the weight of new buildings and this would need to be studied.

7) The soils found in the meadow also might be appropriate for the endangered Ohlone Tiger Beetle and this should be studied.

Thank you,
Angela Harris

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Housing west deir

1 message

John McGuire <johnandcarol@att.net> Sun, Nov 26, 2017 at 2:39 PM
To: eircomment@ucsc.edu

The draft Eir for the building of additional housing for up to 3000 students must address the following:

Will the proposal alleviate the student housing, off campus, crisis and allow existing non-student residents with much needed housing?

What are the alternatives to the do nothing alternative? Will the possible increase in student population be allowed to attend? If so, where will they be housed, where will the increased water demand come from, how will the increased transportation demands be meet, and what are the issues in the community from an increase in student influx?

What are the obstacles to capping the student population at present levels? Cannot the university policy be changed to account for the limits of the community? What is the limit of the Santa Cruz community, has it been reached? If so, is this not enough to limit student population to existing or even less?

The County leaders are presently holding meetings to determine the "vision" for Santa Cruz. What if the vision involves the element of present population limit? How can the university expansion fit with a vision that enough is enough?

John McGuire
415 national street
Santa Cruz, ca 95060
Johnandcarol@att.net
831 425 4744

Sent from my iPad

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Student Housing West Project Comments

1 message

Work Gmail <cmisunas@ucsc.edu> Thu, Nov 30, 2017 at 4:52 PM
To: eircomment@ucsc.edu

I oppose building structures on the Great Meadow near Hagar Dr. and Coolidge Dr. The current open space perfectly complements the existing nearby historic structures and maintains the integrity of the original working ranch area of lower campus. It's a wonderful wildlife and livestock viewing area. Development of the Great Meadow would severely impact the breathtaking panoramic bay view from the colleges and East Fields above. Please do not build there!

Sincerely,
Chad Misunas
Staff, UCSC Physical Plant

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Student Housing West Project Comments

1 message

Jill Misunas <jcmisuna@ucsc.edu> Thu, Nov 30, 2017 at 4:39 PM
To: eircomment@ucsc.edu

I oppose building structures on the Great Meadow near Hagar Dr. and Coolidge Dr. The current open space perfectly complements the existing nearby historic structures and maintains the integrity of the original working ranch area of lower campus. It's a wonderful wildlife and livestock viewing area. Development of the Great Meadow would severely impact the breathtaking panoramic bay view from the colleges and East Fields above. Please do not build there!

Sincerely,
Jill Misunas
Staff, UCSC Physical Plant

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Hagar drive development

1 message

Cheryl Penn <cheryl.penn@gmail.com> Thu, Nov 30, 2017 at 7:26 PM
To: eircomment@ucsc.edu
Cc: Pete S <offbeatpete@outlook.com>

Hello,
I want to voice concern about the proposed family housing project at the corner of hagar drive and coolidge. I think this a bad idea because of the following: 1) car traffic Vs. pedestrians 2) pollution 3) impact to wildlife 4) university image 5) choice of building company 6) upper campus locations.

1. Drivers can get up to 60 mph passing that corner at night. Its a pretty regular thing that goes unpoliced. College-aged drivers around little kids could really be dangerous. I can't think of a worse intersection for children and parents to cross every day. The increased pedestrian traffic will have an impact to every driver that goes on campus.
2) The pollution created during the build will be significant. The polluted air from the trucks and noise level will impact residents in the area. The light pollution will be the worst, white LEDS that burn the retina and will make the meadow look like a baseball diamond. it's sending the wrong message to Santa Cruz visitors about campus and our world-class astronomy science? You need a dark place. No matter that the observatory is elsewhere. Perception and image will take precedent.
3) Given the increase in cars and traffic, the wildlife road kill could be a serious side effect on people density at that intersection.
4) building in that location is an alumni, donor-relations fiasco. Its difficult to manage an image of a pristine campus that cares about environmental studies and the special one-of-a-kind sites in the area when you build right on top of its signature, iconic location. Its a public relations DISASTER. Warch Facebook explode with outrage.
5) I'm concerned about the construction company choice. A recent article in The City On A Hill suugested they have checked their ethics at the door. Shady business practices. Again, terrible PR choosing a non-local company.
6) everyone knows that upper campus will be developed. I think everyone would rather you do it there. Put in the infastructure. Take the time to do it right. Its going to happen in 5 years anyway so why would you destroy the beauty of lower campus? Please consider the long view.
Thank you,
Cheryl Penn

Scanned 12/1/17

UC Santa Cruz 2005 LRDP
Student Housing West Project
DRAFT EIR, SCOPING MEETING
(November 29, 2017)

Written scoping comments may be submitted tonight by placing them in the labeled box at the back of the room, or throughout the public review period, by mail to: Alisa Klaus, UC Santa Cruz, Physical Planning & Construction, 1156 High St., Santa Cruz, CA 95064, or via email to eircomment@ucsc.edu. The scoping period closes on November 30, 2017, at 5:00 PM.

Commenter name: (PLEASE PRINT) Becky Steinbruner

Comments: Please assess all alternatives for location to minimize disturbance of any and all archaeologic and cultural resources as well as sensitive biotic habitats.

Please

Alisa Klaus <aklaus@ucsc.edu>

[eircomment] Submission to EIR NOP about the Hagar Site

1 message

Matthew Waxman <waxman.matt@gmail.com> Thu, Nov 30, 2017 at 4:25 PM
To: eircomment@ucsc.edu

To Whom It May Concern,

I am writing specifically to submit EIR NOP public comments about the addition of the **Hagar Site** ---

A. Please study multiple alternatives to the Hagar site for the Family Student Housing component. Please study all of these:

A.1. Alternatives to the Hagar site being proposed.

A.2. Alternatives that combine the use of multiple sites across the campus -- on the east, west, north and south -- to achieve the housing goals.

A.3. Alternatives that concert parking lots to Family Student Housing, such as converting Parking Lot 116 at the base of campus.

A.4. Alternatives that locate part or all of Family Student Housing adjacent Ranch View Terrace faculty housing.

A.5. Alternatives considering the use of sites off campus that are owned by UCSC, such as the Delaware Ave. site, or land that could be purchased by UCSC and much more cost-effectively developed than the complex land of the campus.

A.6. Alternatives that pursue a Philanthropy driven-approach to pay for the project, instead of the public-private partnership that will produce a private developer Monopoly on-campus.

A.7. Alternatives that see what would happen if UCSC made the decision to slow its student enrollment growth, and added the same number of beds over a much longer time-frame, thus making this current project much smaller.

A.8. Alternatives that see what would happen if UCSC decided to halt and diminish its enrollment growth, so as to not require building the project at all.

B. Please evaluate the following environmental criteria:

B.1. impact to *federally endangered* California Red Legged Frog

B.2. impact to *endangered* Ohlone Tiger Beetle.

B.3. impact to *archaeological remains* from the Amah Mutsun Tribal Band Native American people.

B.4. impact to *habitat continuity* as it passes through the site and connects different parts of the Campus Natural Reserves and to the Pogonip park to the east. Habitat continuity was studied in the 2005 LRDP planning process and was considered as part of its planning criteria. Habitat continuity is important for the ecological and scientific value of the Campus Natural Reserves.

B.5. impact to the unique geological conditions of the campus, with its Karst geology, consisting of potential sink holes and caves below ground.

C. Please do proper traffic, transportation, and circulation studies:

C.1. for impact to the intersection of Hagar Dr and Coolidge Dr.

C.2. on the traffic impact that may impede necessary access to the UC Santa Cruz Women's Center that is located in Cardiff House.

C.3. for impact to traffic on faculty access to and from the Ranch View Terrace faculty housing.

C.4. for impact to the intersection of Bay and High.

D. Please study impact the project will have on the visibility and view corridors from:

D.1. view from Coolidge Drive looking east, from the intersection of Hagar and Coolidge.

D.2. view from Coolidge Drive looking south, when an automobile and pedestrian are approaching the site from Coolidge Drive adjacent Pogonip.

D.3. view from far southern edge of the running track on the East Playing Field that is part of OPERS.

D.4. from Hagar Drive, looking south, when one is driving or walking down Hagar drive toward the Hagar and Coolidge intersection.

D.5. view from the entry and parking lot of the Center for Agroecology & Sustainable Food Systems

D.6. view from the Cowell Ranch Historic Hay Barn

D.7. view from the bike path that runs through the Great Meadow. This view should be studied at the highest points of elevation along the bike path, looking south.

D.8. view from the UCSC Music Center entry court that overlooks the Great Meadow.

D.9. view from Parking Lot 116, looking north-east toward Coolidge Drive.

D.10. view from Hagar Court, looking north, upon exiting Cardiff Terrace.

Thank you,
Matthew Waxman

--
Matthew Waxman
Porter College Councilor - UCSC Alumni Council
UC Santa Cruz 2006 | Harvard GSD 2012

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eircomment@ucsc.edu
https://lists.ucsc.edu/mailman/listinfo/eircomment

TRANSCRIPT

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TRANSCRIPT

UCSC MEETING

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2425 Porter Street, Suite 9 • Soquel, CA 95073 • creeksidecourtreporting.com

JOLIE KERNS: This is the EIR scoping session. The purpose of this part of the meeting is to allow members of the public and representatives of public agencies to provide oral comments on the environmental issues that should be covered in the EIR for this project.

So I am going to turn it over to Alisa Klaus. She is our senior environmental planner, and she will describe the scoping session and the CEQA process a little bit more.

ALISA KLAUS: So the California Environmental Quality Act, or CEQA, requires that state and local agencies identify the significant environmental impacts of their actions and to avoid -- and that they avoid or mitigate those impacts if feasible. A public agency must comply with CEQA when it takes an action which may cause a physical change in the environment. And the University of California is a public agency in this case.

Under CEQA, an Environmental Impact Report, or EIR, is a detailed statement that describes and analyzes the significant and environmental impacts of a project and discusses ways to mitigate or avoid these effects.

As a first step in the EIR process, the public agency, in this case the University of California, circulates a Notice of Preparation that initiates a 30-day period in which agencies and members of the public may provide input on the scope and content of the EIR. The meeting this evening is to provide an opportunity for people to provide this type of input.

There's just a little bit of background to the Notice of Preparation for this EIR. The Notice of Preparation that is the subject of the scoping meeting was issued on October 31, 2017. This notice is actually the second revision of a Notice of Preparation the campus originally issued in April 2017 for an amendment to the UC Santa Cruz 2005 long-range development plan to support the development of student housing on the west campus. You have learned through the presentation that Steven Chad gave, the project has -- the thinking about the project and its siting have evolved over the past year, and we have had to make some adjustments to the CEQA process as that has happened.

The first revision of the Notice of Preparation was issued in August 2017 and included the development of the 3,000-bed Student Housing West Project on the west side of campus.

As was mentioned earlier today, the project has now been modified to move the new student family housing and child care to a different site that was not referred to, that was not described in the August 2017 Notice of Preparation.

So the campus issued the October 31 Notice of Preparation to inform agencies and members of the public that the Environmental Impact Report will also cover development at this new site that we are calling the Hagar site.

So the Student Housing West EIR will evaluate and disclose the environmental impacts from the construction and operation of the Student Housing West Project, which will include the development and addition west of Heller Drive and the Hagar site.

The EIR will cover all of the issue areas identified in Appendix G of the CEQA guidelines. Aesthetics, agriculture, and forestry resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation and transportation and traffic utilities and service systems. In addition, the EIR will include new analysis of greenhouse gas emissions, water supply, and population and housing for the 2005 LRDP.

The campus anticipates that we will be publishing a draft EIR for the project in March 2017, and there will be a 45-day public review period for the EIR, and there will be a public hearing that will -- where members of the public and agencies will be allowed -- will be given the opportunity to provide oral comment in addition to the opportunities for written comments of various kinds. And the publication date will be announced on the physical planning and construction website, in the press and through the campus CEQA distribution list and through the State Office of Planning and Research.

There on the table by the backdoor, there is a sign-up list, and if you sign up on that list, then you will be included on the distribution of the future CEQA notices for this project.

After publication of the draft EIR and the 45-day review period, the campus will prepare a final EIR. The final EIR will include written responses to all of the comments on the draft EIR and may include revisions to the draft EIR as appropriate.

The university will then consider whether to approve the proposed action and certify the Environmental Impact Report and will make findings regarding the conclusions presented in the EIR. We anticipate that this action, which will be the approval of the design of the Student Housing West Project, will be considered by the regents of the University of California in July 2018.

If any of you have submitted a comment in response to the April or August versions of the Notice of Preparation, those scoping comments are part of the record and will be considered in the EIR as appropriate if they are still applicable.

JOLIE KERNS: So I am just going to give a little -- a few kind of details on this public comment session and how we'll do it.

We have a court reporter here, who will be recording the comments from this evening, and all of your oral comments will be included in a written transcript.

So if you'd like to speak, we have forms, request-to-speak forms. We need to make sure that we are able to record your name properly and correctly. So you can hand it to the court reporter when you come up to speak. We'll keep --

Do you want to hand them out or --

ALISA KLAUS: Yeah. If anybody is interested in speaking, just raise your hand, and I'll make sure you get a form.

JOLIE KERNS: There's also forms for written comments, and you can submit this at this meeting. There's a box in the back over here for that. You are also able to submit comments by mail or e-mail. Information on where to send written comments are provided on the handout on the table near the entrance. So if you look back on this table here, we've got information on that. And we're -- all of the written comments should be submitted by November 30 at 5:00 p.m. There's also a sign-up sheet for those that would like to receive more notification on this process.

And with that I think we'd like to open up this meeting to comments on environmental issues that you may all have with regard to the Student Housing West EIR. So you are welcome to make oral comment now.

TRACI FERDOLAGE: And, please, before we get started, we do have a court reporter here. So please make sure that we pause a second to ensure we get your name and that we get the question and everything recorded well -- or the comment recorded well.

ALISA KLAUS: Yes. So if you are ready to make a comment, you can just come down and hand -- actually, you can hand this to the court reporter so she'll have your name spelled properly.

ERIC GRODBERG: My name is Eric Grodberg, G-r-o-d-b-e-r-g. I am a UCSC graduate. I also went to a UC graduate program. I value UC a lot.

My problem with this program --

Should I use the microphone?

TRACI FERDOLAGE: No. I think you are fine.

ERIC GRODBERG: -- is that you talked about taking into account the values of the students. I can tell you for sure the number one values of the students about housing are the price. It's just outrageous what you guys charge on campus. I mean, it's in the neighborhood of $1,500 per person to share a dorm room. So you are looking at a triple dorm room, no -- you know, gang bathroom down the hall, no kitchen, somewhere in the neighborhood of $4,500.

And so that's what creates the pressure for students to move into town. It benefits me financially because I am a landlord, but it really hurts the students because they are paying so much money, and it hurts the community because, you know, it drives up rents.

So I thought that the reason behind the P3 was that you were gonna try to get around some of the bureaucracy involved in UC building and try to develop more affordably. So I'm -- you know, I don't need spin here, especially at this meeting. I understand this is an official CEQA thing, but I really feel like you need to figure out a way to make campus housing even, you know, just slightly more affordable. I have a six-bedroom house. If I were charging what you were charging, I'd be getting $25,000 a month for it. So with that kind of financial pressure on the students, that's why they move off campus.

And I know what you guys do. You have a captive audience or captive residents. All the freshmen have to live on campus with very few exceptions, and then most of the upper classmen move off campus. So you are gonna always have that dynamic unless you get your housing be more affordable.

So I think in terms of specifics, CEQA environmental impacts, they go to traffic and housing primarily, and they are going to continue to have severe impacts, you know, circulation of traffic and population and housing again.

So I am really pretty disappointed that you're saying the rates are going to stay the same. And I understand you have certain building costs. I've heard this many times. You've got the geology. You have building standards mandated by the State. You've got prevailing wage. But let's get real. You don't have to pay for land. You don't have to make a profit. You don't have to pay any city permit fees, school district fees. You don't have to go through the city planning process. You are building dorms, not houses or apartments. So that's less amenities in the buildings themselves. So I really think you need to figure -- take a real good look at your development process and figure out where you can -- you know, what you are doing wrong because, you know, there's no way a private developer making profit would, you know, come in anywhere near the cost that you guys are doing. So I don't know if you're cooking the works or if it's just really inefficient or what's going on, but if you are going to go to the P3, why don't you leverage, you know, it so that you can actually build affordably.

Thank you for hearing my comments.

JAMES HOLLOMON: My name is James or Jamie Hollomon. I am just a resident of Santa Cruz. I've been here for five years. I was here five years before that 30 years ago. So I've seen some difference in the town and the university. I have extraordinary love of the university. My niece and others went to this university.

However, I guess a little bit piggybacking on the last speaker, at least what I've seen so far, this isn't presented in a context in the city. It's presented as a project on the campus.

The numbers, while I still have questions about them and some of them can be provided, my general take is that the net effect of this on the city, if every one of the students occupied the rooms that are planned -- and there was a question raised by the last speaker as to whether they would. But let's assume that they did. It seems that by the time the larger unit is built, that the net effect on the city is not a reduction in the number of students in the city. It's actually still, by 2022, an increase. That demonstrates kind of a blindness to the overall situation going on in the city.

If the agreement with the city and the university was to provide these 3,000 units on the assumption by the city that it was to reduce the impact on the city, it is fairly clear to me by the numbers that that isn't going to happen because the net impact on the city is still roughly the same at the end of the process as it is at the beginning. So basically the new beds have absorbed the new growth on the campus with some small difference based on taking people out of lounges.

That leaves me as a resident of the city who, if, for instance, my landlord decided to sell, I would be in the situation of other people who don't make a lot of money in this town. I am a therapist. We are not rich. It leaves the pressure on the city by the student body just as bad as it is now. And right now it's quite bad. It's bad for the students because they are being forced, in effect, to quadruple up in two-bedroom apartments, but it's also bad mostly for anyone in the city making less than $60,000 because if you are making less than $60,000, you can't compete with five students in a house. You can't afford it.

So if you are a family and you are a family of a worker who works in a city store or a city library or anywhere else, for that matter, at the university dining hall, you have almost no option left. So people are moving out of town. And as you may know, as in Napa Valley and many other places, the people who actually are the workers in the town or providing other necessary services are having to drive an hour, two hours, whatever, from where they can afford to live.

So it seems like the city -- the city's housing -- the city's effort to provide affordable housing, which is inadequate, and the university's effort to provide affordable housing is not working together in a sufficient way.

Thank you very much.

I wanted to add that it would seem that specifically the project needs to have defined the impact of the numbers of students on the city so that the people of the city can understand the impact of the project on the city as well as on the university.

Thank you.

BECKY STEINBRUNER: I'm sorry. I arrived late, and so I don't know the process.

Is this a time when the public can make comment?

ALISA KLAUS: Yes. So you can make a comment on the scope of the EIR, of the Environmental Impact Report. And if you'd like to do that, you can fill out a request-to-speak form so the court reporter can have your name spelled properly. There's also forms for written comments. If you would like to make a written comment, you can do that as well.

Would you like a comment form?

BECKY STEINBRUNER: I would like to make a comment. Thank you.

ALISA KLAUS: If people can limit their comments to three minutes, that would make sure that everyone has a chance to speak.

BECKY STEINBRUNER: Thank you.

Do I need to fill this out in advance?

ALISA KLAUS: Yeah. Put your name down and give it --

BECKY STEINBRUNER: Thank you.

So I don't know who I am speaking to. I think you so I'll sit closest to you.

My name's Becky Steinbruner. I am a resident of Aptos. My family and I have lived there for over 30 years, and recently I've become more involved in local politics and issues that are of great concern to the community at large. And by and large, it is the issue of lack of housing, not only lack of housing, but of affordable housing. And as the people who have spoken before me have said, it's driven by the high demand and great impact fueled by the necessity for the student housing. It doesn't exist here on campus or at least is not affordable on campus.

So I really think it's time for the university to address the issue of the impacts of student -- lack of student -- affordable student housing on campus and how that impacts the community and the community's affordable housing issue.

In this scoping, I would like to make sure that, as the alternatives are considered, it's very thoughtfully examined the impacts of lack of affordable housing on campus has on the communities, not only the housing, but also the infrastructure, transportation needs, traffic, and also the water demands and also the social implications of, as these gentlemen have said, the permanently housed people who perform some of the lower paying jobs within the city and other incorporated cities, unincorporated areas of the county have had to move away or to move farther.

I know people that are actually commuting from Central Valley because they can afford to live there, and they sleep on a friend's couch so that they can afford to stay here and hold their jobs. That's not right. And I really think that a part of that pressure is being driven by the lack of affordable housing for student population. And I think that tied with all of that, the university needs to stop admitting more students until they can guarantee an affordable place on campus for all students who are enrolled here. So I want that very clearly and carefully examined within the scope of the EIR.

Thank you very much.

ANGELA HARRIS: Hi. My name is Angela Harris. I am an alumni from UCSC. I have three main points for this scoping period, mostly regarding the site proposed for the bottom of the Great Meadow for the new families housing site.

First I would like to suggest that a comprehensive vegetation survey be done. Coastal prairie in California is a very rare and valuable habitat in terms of biodiversity, and we need to know what kind of plants are there that might be rare or threatened species.

Second, I would like to suggest a comprehensive archaeological survey be done. From my understanding, there are often village remains found in meadows from the Amah Mutsun Tribal Band people who used to live in this area.

And, third, I know that there is already habitat designated down near the faculty housing for the endangered California red-legged frog, and this new site at the bottom of the Great Meadow is within fairly close proximity to that habitat. I know that from the US Fish and Wildlife Service, they have a revised guidance on site assessments and field surveys for the California red-legged frog. On page 17, it says that, "Disbursing frogs have been recorded to cover distances from a quarter mile to more than two miles without apparent regard to topography, vegetation type of riparian corridors. So since this site, I think, is within two miles of their habitat, the red-legged frog would be a third concern to cover in the scoping period.

JOLIE KERNS: Do we have any other comments? Okay.

ALISA KLAUS: So there is still an opportunity to submit written comments. We have handouts which have a little bit of information about the project and the CEQA process and a mailing address and website where you can send written comments to, and, again, we also have a mailing list that you can sign up to receive our CEQA notices for this and also any other projects on campus.

And then I also have, in case -- I don't know if any of you have received a Notice of Preparation or found it on the website, but I also have some more copies of the Notice of Preparation for this evening if you would like to review that.

JOLIE KERNS: Thank you, everyone, for your time, for taking time to listen about the project and offer your comments on this project. We appreciate your time.

(Proceedings in the above-entitled matter were concluded at 7:27 p.m.)

--oooOooo--

STATE OF CALIFORNIA)
) SS:
COUNTY OF SANTA CRUZ)

I, Cary Blue LaTurno, hereby certify that I was present and took down correctly in stenotype to the best of my ability all the testimony and proceedings in the foregoing-entitled matter; and I further certify that the annexed and foregoing is a full, true, and correct statement of such testimony.

Dated at Santa Cruz, California, on December 10, 2017.

Cary Blue LaTurno

NDTCA · Signed Electronic Transcript

Cary Blue LaTurno

CSR No. 9681

APPENDIX 4.2

Air Quality and Greenhouse Gas Emissions Technical Memorandum

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
1 Willowbrook Court, Suite 120
Petaluma, CA 94954

Memo

Date: January 10, 2018

To: Shabnam Barati, Ph.D.
Principal
Impact Sciences

From: James A. Reyff
Illingworth & Rodkin, Inc.

Re: **UC Santa Cruz Student Housing West, Santa Cruz, CA**

Subject: **Air Pollutant and GHG Emissions Modeling and Construction Cancer Risk Assessment**

I&R Job: 17-070

The proposed UC Santa Cruz Student Housing West (SHW) project is an approximately 3,000-student bed project, which is planned for completion by UC Santa Cruz by 2022. The SHW project is split into two sites: the Hagar Site where the project would construct approximately 148 units of housing for student families and a day-care center northeast of the intersection of Glen Coolidge Drive and Hagar Drive, and the Heller Site where the project would demolish existing buildings and construct approximately 2,852 student beds west of Heller Drive. The project would also construct utility corridors to provide water and wastewater service to the new sites.

This memo presents the results of air pollutant and greenhouse gas (GHG) emissions modeling using the California Emissions Estimator Model (CalEEMod Version 2016.3.2) and a cancer risk assessment of construction emissions predicted from the Hagar site. Note that the Hagar site is located near existing sensitive receptors. The Heller site is not located near sensitive receptors. Sensitive receptors are groups of people more affected by air pollution than others. The California Air Resources Board, or CARB, has identified the following persons who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. Sensitive receptors, which include residences are located near the project sites. For the Heller site, these are student residences that do not include small children or infants. The Hagar site is near existing residences that are assumed to all include infants or small children. For typical construction cancer risk assessments, only infants are considered sensitive receptors because of the high sensitivity to cancer causing contaminants, or toxic air contaminants (TACs), whereas, children and adults are much less sensitive and the exposure periods are relatively short. As explained later in this memo, the cancer risk assessments assume a much greater sensitivity of infants to TACs and a higher breathing rate.

Construction and Operational Air Pollutant and GHG Emissions

Thresholds of Significance for Criteria Pollutants

Thresholds of significance are used to determine the significance of a project's environmental effects. Per Section 15064.7 of the CEQA Guidelines, a threshold is an identifiable quantitative, qualitative or performance level of particular environmental effect, non-compliance with which means the effect will normally be determined to be significant and compliance with normally means the effect will be determined to be less than significant.

The following summarizes the Monterey Bay Air Resources District (MBARD) thresholds of significance for evaluating air quality impacts for permits, rulemaking, and plans. A proposed project will not have a significant air quality effect on the environment, if the following criteria are met.

MBARD Daily Construction Emissions Thresholds

Pollutant (pounds per day)	Significance Threshold Construction
ROG	137 (direct & indirect)
NO_X	137 (direct & indirect)
CO	550 (direct)
PM_{10}	82 (on-site)
$PM_{2.5}$	55 (on-site)

MBARD Daily Operational Emission Thresholds

Pollutant (pounds per day)	Significance Threshold Operation
ROG	137 (direct & indirect)
NO_X	137 (direct & indirect)
CO	550 (direct)
PM_{10}	82 (on-site)
$PM_{2.5}$	55 (on-site)

Construction Emissions

The California Emissions Estimator Model (CalEEMod) Version 2016.3.2 was used to estimate emissions from construction and operation of the project assuming full build-out conditions. The project land use types and size, and anticipated construction schedule were input to CalEEMod. Separate modeling was conducted for the Heller and Hagar sites. The Heller site modeling was divided into two modeling scenarios: Demolition and Construction. In addition, the Hagar site construction modeling was conducted for the residential and daycare portions separately.

The model predicts emissions of ozone precursor pollutants, reactive organic gases (ROG) and nitrogen oxides (NOx), respirable particulate matter (PM10) and fine particulate matter (PM2.5). In addition, the model predicts emissions of greenhouse gases. Particulate matter emissions (i.e., PM10 and PM2.5) are divided into fugitive and exhaust components. Construction activities, particularly during site preparation and grading would temporarily generate fugitive dust in the form of respirable particulate matter (PM10) and PM2.5. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries.

Rather than relying on the CalEEMod default assumptions that are based on project size and type, project-specific construction information was used. The construction schedule and estimated equipment activity was provided for each of the construction projects. These were provided as follows:

- Estimated dates for Start and Finish
- Schedule in terms of weeks for each phase,
- Equipment activity for each phase in terms of
    - Equipment type
    - Quantity
- Equipment usage factor (%) per day by phase that was applied to daily hours of use

Construction activity for each project is described below.

Heller Site

For this portion of the project, the proposed project land uses input to CalEEMod included:

- 725 dwelling units to represent undergraduate housing,
- 146 dwelling units to represent graduate housing,
- 3,500 sf of "General Heavy Industry" to represent the wastewater treatment plant, and
- 414 spaces of "Parking Lot."

CalEEMod provides emission estimates for both on-site and off-site construction activities. On-site activities are primarily made up of construction equipment emissions, while off-site activity includes worker, hauling, and vendor traffic. A construction build-out scenario, including equipment list and schedule, was provided and input to the model. The project was assumed to include 40,000 cubic yards (cy) of soil import during site grading and was entered into the model to reflect the number of haul trips anticipated.

Demolition of the Heller site would include the removal of 199 townhouses in 42 buildings. To estimate truck trips, each dwelling unit was estimated to be 1,200 sf (this includes amenity spaces). Demolition activity is assumed to occur for 4 months, beginning in 2019.

The construction schedule assumes that the project would be built out over a period of approximately 3 years, beginning in August 2019, or an estimated 790 construction workdays (assuming an average of almost 22 construction days per month).

Hagar Site

For this portion of the project, the proposed project land uses input to CalEEMod included:

Residential Construction:

- 148 dwelling units to represent Family Housing Units,
- 30 spaces of "Parking Lot."

Daycare Construction:

- 13,500 sf of "Day-Care Center"

As described previously, CalEEMod provides emission estimates for both on-site and off-site construction activities. On-site activities are primarily made up of construction equipment emissions, while off-site activity includes worker, hauling, and vendor traffic. The construction build-out scenario, including equipment list and schedule, was provided and input to the model. The project was assumed to include a balanced site, but 1,000 cy of soil/material import and export was assumed during site grading and was entered into the model to reflect the number of haul trips anticipated. Note that the project would include prefabricated construction, so the modeled activities are likely overestimated.

The most aggressive construction schedule assumes that the residential project would be built out over a period of approximately 330 days, beginning in September 2018, while the day-care facility is constructed over a period of 5 months during in late 2018. In 2018, there would be an estimated 110 days of day-care facility construction and 60 days of residential construction. In 2019, there would be an estimated 220 days of residential construction.

Project Construction Emissions

Table 1 presents the construction-period air pollutant emissions in tons per year and pounds per average day in each year. The number of construction days was estimated for each year, as shown in Table 1. While the construction period may be longer, the model assumes a more intensive schedule and that was used to compute daily emissions. The average emissions per day were computed by dividing total emissions from construction by the number of days that the model computed for each calendar year for each construction project.

Table 2 shows the maximum summer day emissions in pounds per day for each calendar year. These emissions are based on the maximum summer day output for each project. Note that for years with multiple project construction (i.e., 2018 and 2019), the emissions reported assume that maximum summer day emissions occur on the same days for each construction site. Also, ROG emissions from architectural coatings are anticipated to occur throughout the architectural coating phases, estimated to be 50 weeks; therefore, the average daily emissions in Table 1 is a better prediction of those emissions.

Attachment 1 includes the CalEEMod modeling output.

Table 1. Project Construction Air Pollutant Emissions – Total Annual and Average Daily

Scenario	Year	ROG	NOx	CO	PM10 total	PM2.5 total
		Emissions in Tons from CalEEMod output				
Hagar Daycare (110 days)	2018	0.18	0.93	0.60	0.07	0.04
Hagar Residential (60days)	2018	0.10	1.07	0.75	0.10	0.05
Hagar Residential (220 days)	2019	1.09	1.47	1.48	0.16	0.09
Heller Demolition (88 days)	2019	0.06	0.67	0.42	0.16	0.04
Heller Residential (44 days)	2019	0.20	2.42	1.29	0.36	0.16
Heller Residential (260 days)	2020	1.17	9.64	9.87	1.39	0.64
Heller Residential (260 days)	2021	4.09	6.36	7.83	0.95	0.42
Heller Residential (120 days)	2022	2.96	0.44	0.67	0.09	0.04
		Emissions in Tons				
Total	2018	0.28	2.00	1.35	0.17	0.10
Total	2019	1.35	4.56	3.19	0.68	0.29
Total	2020	1.17	9.64	9.87	1.39	0.64
Total	2021	4.09	6.36	7.83	0.95	0.42
Total	2022	2.96	0.44	0.67	0.09	0.04
		Emissions in Average pounds per day				
Average Daily	2018	7	53	36	5	3
Average Daily	2019	20	**139**	82	21	9
Average Daily	2020	9	74	76	11	5
Average Daily	2021	31	49	60	7	3
Average Daily	2022	49	7	11	2	1

Table 2. Project Construction Air Pollutant Emissions – Maximum Summer Day

Scenario	Year	ROG	NOx	CO	PM10 total	PM2.5 total
		Emissions in Tons from CalEEMod output				
Hagar Daycare	2018	5.8	69.8	39.7	6.1	3.0
Hagar Residential	2018	5.6	65.4	38.8	5.8	2.9
Hagar Residential*	2019	91.8	13.7	14.0	1.6	0.8
Heller Demolition*	2019	1.4	16.6	10.5	4.0	1.1
Heller Residential**	2019	13.5	169.3	86.4	23.5	11.7
Heller Residential	2020	12.7	156.5	83.2	23.1	11.2
Heller Residential	2021	57.9	65.3	83.0	10.2	4.4
Heller Residential	2022	51.3	17.8	20.8	2.1	1.1
		Emissions in Pounds Per day				
Total	2018	11	135	79	12	6
Total	2019*	93	30	25	6	2
Total	2019**	14	169	86	24	12
Total	2020	13	157	83	23	11
Total	2021	58	65	83	10	4
Total	2021	51	18	21	2	1

* Assumes maximum Hagar construction and Heller demolition occur simultaneously

** Only Heller Residential construction, which would not overlap with Hagar construction or Heller Demolition

Operational Emissions

CalEEMod also provides estimates of operational emissions. The proposed project would not result in substantial daily emissions from the use of automobiles. This is because students living in the on-campus housing would walk, ride a bike or take a UCSC shuttle to travel between the project site and the classes. Furthermore, the project would provide limited parking as freshmen are not allowed to bring cars to the campus. In addition, the project would reduce daily trips compared to the no project scenario because students who would otherwise live off campus and make trips to the campus would instead live on campus. However, conservatively the CalEEMod default trip generation rates and travel characteristics were used. There is no student housing type of land use available in CalEEMod.

The project includes seven back-up generators at the Heller site that would be powered by natural gas. These vary in size (i.e., 30 kW to 400 kW) and location. Testing of these generators would occur for 15 minutes every 6 weeks or about 2 hours per generator per year. Although not specifically planned, it was assumed that all generators would be tested for 15 minutes on a summer day for the modeling. CalEEMod was used to compute the emissions associated with these generators.

Table 3 reports operational emissions from the project, including the overestimated mobile emissions.

Table 3. Project Operation Air Pollutant Emissions (with Mobile Sources) – Maximum Summer Day

Scenario	ROG	NOx	CO	PM10 total	PM2.5 total
	Emissions in lbs./day from CalEEMod				
Hagar Residential & Daycare	9.2	21.6	59.6	8.8	5.5
Heller Residential	44.8	69.8	238.0	37.1	10.7
Total	54	91	298	46	16

Construction Health Risk – Hagar Site

Project Construction

The proposed project would expose sensitive receptors to temporary emissions of TACs while construction activities at the Hagar construction site[1] take place. Most on-site construction equipment would be diesel-powered. DPM that would be emitted from this equipment and trucks used during construction is a TAC that can cause increased cancer risk. DPM is designated as a toxic air contaminant by CARB for the cancer risk associated with long-term exposure. The closest sensitive receptors to the project site are residences south of the construction site, across Glen Coolidge Drive. Additional residences are at farther distances from the Hagar site. The primary concern for nearby sensitive receptors would be exposure to DPM emissions from diesel-powered construction equipment and diesel trucks associated with project construction activities. This evaluation models DPM emissions from project construction activities to obtain DPM concentrations at nearby sensitive receptors. These DPM concentrations are then used to predict cancer risk and non-cancer health hazards. Figure 1 shows the project site and sensitive receptor locations where potential health impacts were evaluated based on the air quality dispersion modeling analysis.

Cancer Risk Methodology

A health risk assessment for exposure to TACs requires the application of a risk characterization model to the results from the air dispersion model to estimate potential health risk at each sensitive receptor location. The State of California Office of Environmental Health Hazard Assessment (OEHHA) and CARB develop recommended methods for conducting health risk assessments. The most recent OEHHA risk assessment guidelines were published in February of 2015.[1] These guidelines incorporate substantial changes designed to provide for enhanced protection of infants and children, as required by State law, compared to previous published risk assessment guidelines. CARB has provided additional guidance on implementing OEHHA's recommended methods.[2] This health risk assessment used the recent 2015 OEHHA risk assessment guidelines and CARB guidance. Current Monterey Bay Air Resources District (MBARD) regulations/guidelines (Rule 1000 – Permit Guidelines and Requirements for Sources Emitting Toxic Air Contaminants) specify use of the most recent OEHHA guidelines when conducting health risk assessments. The new OEHHA guidelines and CARB recommended exposure parameters were used in this evaluation.

Potential increased cancer risk from inhalation of TACs are calculated based on the TAC concentration over the period of exposure, inhalation dose, the TAC cancer potency factor, and an age sensitivity factor to reflect the greater sensitivity of infants and children to cancer causing TACs. The inhalation dose depends on a person's breathing rate, exposure time and frequency of exposure, and the exposure duration. These parameters vary depending on the age, or age range, of the persons being exposed and whether the exposure is considered to occur at a residential location or other sensitive receptor location.

The current OEHHA guidance recommends that cancer risk be calculated by age groups to account for different breathing rates and sensitivity to TACs. Specifically, they recommend evaluating risks for the third trimester of pregnancy to age zero, ages zero to less than two (infant exposure), ages two to less than 16 (child exposure), ages 16 to 70 (adult exposure). Age sensitivity factors (ASFs) associated with the different types of exposure are an ASF of 10 for the third trimester and infant exposures, an ASF of 3 for a child exposure, and an ASF of 1 for an adult exposure. Also associated with each exposure type are different breathing rates, expressed as liters per kilogram of body weight per day (L/kg-day). For this evaluation, as recommended by CARB, the 95th percentile breathing rates are used for all age groups. Additionally, CARB and the MBARD recommend the use of a residential exposure duration of 30 years for sources with long-term emissions.

Functionally, cancer risk is calculated using the following parameters and formulas;

Cancer Risk (per million) = $CPF \times Inhalation\ Dose \times ASF \times ED/AT \times FAH \times 10^6$

Where:

CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$

ASF = Age sensitivity factor for specified age group

[1] OEHHA, 2015. *Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Office of Environmental Health Hazard Assessment. February.

[2] CARB, 2015. *Risk Management Guidance for Stationary Sources of Air Toxics*. July 23.

ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} *x DBR x A x (EF/365) x* 10^{-6}

Where:

C_{air} = concentration in air (μg/m^3)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

The health risk parameters used in this evaluation are summarized in Table 3.

Table 3. Health Risk Parameters Used for Cancer Risk Calculations

Parameter	***Exposure Type***	**Infant**		**Child**	**Adult**
	Age Range	**3rd Trimester**	**0<2**	**2 < 16**	**16 - 30**
DPM Cancer Potency Factor (mg/kg-day)$^{-1}$		1.10E+00	1.10E+00	1.10E+00	1.10E+00
Daily Breathing Rate (L/kg-day)*		361	1,090	745	335
Inhalation Absorption Factor		1	1	1	1
Averaging Time (years)		70	70	70	70
Exposure Duration (years)		0.25	2	14	14
Exposure Frequency (days/year)		350	350	350	350
Age Sensitivity Factor		10	10	3	1
Fraction of Time at Home		1.0	1.0	1.0	0.73

* 95th percentile breathing rates

Non-Cancer Hazards

Potential non-cancer health hazards from TAC exposure are expressed in terms of a hazard index (HI), which is the ratio of the TAC concentration to a reference exposure level (REL). OEHHA has defined acceptable concentration levels for contaminants that pose non-cancer health hazards. TAC concentrations below the REL are not expected to cause adverse health impacts, even for sensitive individuals. The total HI is calculated as the sum of the HIs for each TAC evaluated and the total HI is compared to the MBARD significance threshold of a HI greater than 1.0 to determine whether a significant non-cancer health impact from a project would occur.[3]

Typically, for projects involving construction with substantial TAC emissions, the primary TAC of concern with non-cancer health effects is DPM. For DPM, the chronic inhalation REL is 5 μg/m^3.

On-Site Construction TAC Emissions

[3] MBUAPCD Rule 1000

Construction period emissions were computed using the California Emissions Estimator Model, Version 2016.3.2 (CalEEMod) along with projected construction activity. The CalEEMod modeling for both the residential and daycare construction activity was described previously. For computing construction health risk impacts, construction vehicle travel within one mile of the site was included. The modeling was based on a construction period of over about 16 months starting in 2018. The CalEEMod model provided total annual PM_{10} exhaust emissions (assumed to be DPM) for the off-road construction equipment used for construction of the project and for the exhaust emissions from on-road vehicles (haul trucks, vendor trucks, and worker vehicles) of 0.1466 tons (293 pounds) over the construction period. The on-road emissions are a result of on-road haul truck travel during demolition and grading activities and vendor deliveries during construction, with overall trip lengths of one mile to represent on- or near-site travel. Inputs to CalEEMod included the project type, size, acreage, construction schedule, and projected equipment usage. The construction schedule and equipment usage projections were provided and are included in *Attachment 2*.

Dispersion Modeling

The U.S. EPA AERMOD dispersion model was used with screening meteorology to predict concentrations of DPM at existing sensitive receptors in the vicinity of the project site. The AERMOD dispersion model is an OEHHA-recommended model for use in modeling health risk impacts. Exhaust emissions of DPM from construction equipment at the project site were modeled using an area source encompassing the different construction areas at the project site. An emission release height of six meters (19.7 feet) was used for the area source. The elevated source height reflects the height of the equipment exhaust pipes plus an additional distance for the height of the exhaust plume above the exhaust pipes to account for plume rise of the exhaust gases.

The AERMOD model requires the use of hourly meteorological data that are representative of conditions in the vicinity of the site area being modeled. For this evaluation, since site-specific meteorological data was not available, a screening meteorological data set designed to produce conservative air concentrations was used. The screening meteorological data was created for the AERMOD model with the U.S. EPA MAKEMET[4] program, which is designed to find the meteorological conditions that result in the highest pollutant concentrations for the area.

For each receptor location, the AERMOD model calculates 1-hour maximum DPM concentrations using the screening meteorological data. A conversion factor of 0.1 is used to calculate maximum average annual concentrations from the 1-hour maximum concentrations. DPM concentrations were calculated at nearby sensitive receptors (off-site residences) using receptor heights of 1.5 meters (4.9 feet). The maximum-modeled DPM concentration occurred east of the construction area at a residence on Spring Street. The location of the maximum DPM concentration is identified on Figure 1.

Cancer Risk and Hazards

Increased cancer risks were calculated using the maximum modeled annual DPM concentrations and cancer risk assessment methods described previously. Due to the relatively short duration of project construction activities, only infant exposures were assumed in calculating the maximum cancer risk for residential exposures. Because an infant (0 to 2 years of age) breathing rate is greater than the breathing

[4] https://www.epa.gov/scram/air-quality-dispersion-modeling-screening-models

rate for the 3rd trimester the contribution to total cancer risk from an infant exposure is greater than if the initial exposure for the 3rd trimester is assumed. Infant exposures were assumed to occur at residential receptors throughout the entire construction period. In addition to infant exposures, adult exposures and increased cancer risks were calculated.

Results of this assessment indicate that the maximum increased residential cancer risk would be 59.7 in one million for an infant exposure. For adults, the increased cancer risk would be 1.3 in one million. The location of the receptor with the maximum increased cancer risk is shown in Figure 1. While the residential adult cancer risks are below the MBARD's threshold of greater than 10 in one million excess cancer cases, the increased cancer risk for a residential infant exposure is greater than the significance threshold and would be considered a *significant impact*.

Non-cancer hazards for DPM would be well below MBARD threshold at all locations, with the maximum chronic HI computed at less than 0.1. This HI is much lower than the MBARD significance threshold of greater than 1.0.

Attachment 2 to this report includes the emission calculations used for the construction area source modeling and the cancer risk calculations.

Recommended Mitigation Measures

Measures are required to reduce both NOx and diesel particulate matter emissions from construction activity. This includes the following:

1. All diesel-powered off-road equipment larger than 25 horsepower and operating on the project construction sites for more than two days in a row shall meet, at a minimum, U.S. EPA standards for Tier 3 engines or equivalent.

2. All diesel-powered off-road equipment larger than 25 horsepower and operating on the project construction sites for more than two days in a row shall be equipped with diesel particulate matter filters that meet CARB-certified Level 3 Diesel Particulate Filters or alternatively-fueled equipment (i.e., non-diesel) would meet this requirement.

3. Signal boards shall be electrically powered.

4. Provide electrical line power so that diesel-fueled generator use at the Hagar site shall be limited to 100 hours total per construction project.

5. Ensure intensive construction activities at the Hagar and Heller sites do not overlap (note that current schedule indicates these would occur at separate times).

Effects of Mitigation

Maximum summer day emissions and excess cancer risks from project construction were computed after applying the proposed mitigation. The results of the mitigated scenario emissions, reported in Table 4, are from the CalEEMod output for Mitigated Construction emissions and reflects the effectiveness in the construction emissions of the recommended measures listed above. The NOx emissions would be reduced to a level below the threshold of significance.

With mitigation, the computed maximum increased lifetime residential cancer risk from construction (using mitigated PM10 exhaust emissions from CalEEMod) would be 7.7 in one million or less. The cancer risk prediction assumes infant exposure.

Table 4. Mitigated Project Construction Air Pollutant Emissions – Maximum Summer Day

Scenario	Year	ROG	NOx	CO	PM10 total	PM2.5 total
		Emissions in Pounds Per day				
Hagar Daycare	2018	3.1	39.6	42.5	3.4	1.8
Hagar Residential	2018	2.1	36.6	41.0	3.2	1.7
Hagar Residential*	2019	91.8	9.8	13.6	1.3	0.6
Heller Demolition*	2019	1.0	15.2	11.4	1.5	0.6
Heller Residential**	2019	5.4	110.8	104.7	23.5	11.7
Heller Residential	2020	5.3	108.1	103.7	23.1	11.2
Heller Residential	2021	54.5	51.8	88.0	10.2	4.5
Heller Residential	2022	50.3	14.3	24.3	2.1	1.1
		Emissions in Pounds Per day				
Total	2018	5	76	84	7	4
Total	2019*	93	25	25	3	1
Total	2019**	5	111	105	24	12
Total	2020	5	108	104	23	11
Total	2021	55	52	88	10	5
Total	2022	50	14	24	2	1

* Assumes maximum Hagar construction and Heller demolition occur simultaneously

** Only Heller Residential construction, which would not overlap with Hagar construction or Heller Demolition

GHG Emissions

GHG emissions for construction and operation are reported in Table 5. Table 6 breaks down the operational emissions for each site. These are the annual emissions reported as carbon dioxide equivalent or CO2e in metric tons per year. Operational emissions are reflective of 2022 modeling conditions. Because the project is predicted to result in a net reduction of traffic generated by the school campus, operational emissions do not include mobile sources.

Table 5. Annual GHG Emissions (in metric tons)

Scenario	Year	CO_2e	Combined
Emissions from CalEEMod in metric tons per year			
Hagar Daycare Construction	2018	110	
Hagar Residential Construction	2018	144	
			254
Hagar Residential Construction	2019	282	
Heller Demolition Construction	2019	115	
Heller Residential Construction	2019	341	
			1,372
Heller Residential Construction	2020	2,082	
Hagar Residential & Daycare Operation	2020	259	
			2,341
Heller Residential Construction	2021	1,622	
Hagar Residential & Daycare Operation	2021	259	
			1,881
Heller Residential Construction	2022	126	
Hagar Residential & Daycare Operation	2022	259	
			385
	Post 2022*		1,477

*Both Hagar and Heller sites operating and no construction.

Table 6. Annual Operational GHG Emissions (in metric tons)

Scenario		CO_2e
Emissions from CalEEMod in metric tons per year		
Hagar Site (Residential and Daycare)		
	Area	3
	Energy	165
	Mobile	--
	Waste	82
	Water	9
Heller Site (Residential)		
	Area	15
	Energy	966
	Mobile	--
	Waste	204
	Water	33
	Total	1,477
	Stationary Sources:	1

Figure 1. Project Construction Site, Sensitive Receptor Locations, and Location of Maximum TAC Impacts

Health Risk Summary

U.C. Santa Cruz - Hagar Construction Site, Santa Cruz, CA

DPM Construction Emissions and Modeling Emission Rates - Unmitigated

Construction Year	Activity	DPM* (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2018	Daycare Construt	0.0428	CON18DPM	85.6	0.00977	1.23E-03	50,271	2.45E-08
2019*	Housing Construct	0.1038	CON19DPM	207.6	0.02370	2.99E-03	50,271	5.94E-08
Total		***0.1466***		***293***	***0.0335***	***0.0042***		

* DPM emissions assumed to be equal to PM10 exhause emissions.

** Two months of 2018 construction are included in the 2019 emissions

Construction Hours		
hr/day =	24	Screening meteorological data
days/yr =	365	
hours/year =	8760	

DPM Construction Emissions and Modeling Emission Rates - With Mitigation

Construction Year	Activity	DPM (ton/year)	Area Source	DPM Emissions (lb/yr)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area (m^2)	DPM Emission Rate ($g/s/m^2$)
2018	Const-Area 1	0.0033	CON18DPM	6.5	0.00074	9.35E-05	50,271	1.86E-09
2019*	Const-Area 1	0.0157	CON19DPM	31.4	0.00358	4.52E-04	50,271	8.98E-09
Total		***0.0190***		***38***	***0.0043***	***0.0005***		

* DPM emissions assumed to be equal to PM10 exhause emissions.

** Two months of 2018 construction are included in the 2019 emissions

Construction Hours		
hr/day =	24	Screening meteorological data
days/yr =	365	
hours/year =	8760	

U.C. Santa Cruz - Hagar Construction Site, Santa Cruz, CA
Project Construction Health Impact Summary

Maximum Impacts at Off-Site Residences

Construction Year	Unmitigated			
	Max Annual Conc. Exhaust PM10/DPM ($\mu g/m^3$)	Cancer Risk (per million) Infant	Cancer Risk (per million) Adult	Hazard Index (-)
2018	0.1061	17.43	0.39	0.021
2019	0.2572	42.25	0.95	0.051
Total	-	**59.7**	**1.3**	-
Maximum Annual	0.2572	-	-	**0.05**

Construction Year	MITIGATED			
	Max Annual Conc. Exhaust PM10/DPM ($\mu g/m^3$)	Cancer Risk (per million) Child	Cancer Risk (per million) Adult	Hazard Index (-)
2018	0.0081	1.3	0.0	0.002
2019	0.0389	6.4	0.1	0.008
Total	-	**7.7**	**0.2**	-
Maximum Annual	0.0389	-	-	**0.008**

U.C. Santa Cruz - Hagar Construction Site, Santa Cruz, CA - Construction Impacts - Unmitigated Emissions
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Residential Receptor Locations - 1.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	3rd Trimester	0 - 2	2 - 16	16 - 30
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	745	335
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants, children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)	Adult - Exposure Information Modeled DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Adult Cancer Risk (per million)
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-
1	1	0 - 1	2018	0.1061	10	17.43	2018	0.1061	1	0.39
2	1	1 - 2	2019	0.2572	10	42.25	2019	0.2572	1	0.95
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00
Total Increased Cancer Risk						**59.7**				**1.3**

* Third trimester of pregnancy

U.C. Santa Cruz - Hagar Construction Site, Santa Cruz, CA - Construction Impacts - Mitigated Emissions
Maximum DPM Cancer Risk Calculations From Construction
Off-Site Residential Receptor Locations - 1.5 meters

Cancer Risk (per million) = CPF x Inhalation Dose x ASF x ED/AT x FAH x 1.0E6

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
ASF = Age sensitivity factor for specified age group
ED = Exposure duration (years)
AT = Averaging time for lifetime cancer risk (years)
FAH = Fraction of time spent at home (unitless)

Inhalation Dose = C_{air} x DBR x A x (EF/365) x 10^{-6}

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
10^{-6} = Conversion factor

Values

	Infant/Child			Adult
Age -->	**3rd Trimester**	**0 - 2**	**2 - 16**	**16 - 30**
Parameter				
ASF =	10	10	3	1
CPF =	1.10E+00	1.10E+00	1.10E+00	1.10E+00
DBR* =	361	1090	745	335
A =	1	1	1	1
EF =	350	350	350	350
AT =	70	70	70	70
FAH =	1.00	1.00	1.00	0.73

* 95th percentile breathing rates for infants, children and adults

Construction Cancer Risk by Year - Maximum Impact Receptor Location

Exposure Year	Exposure Duration (years)	Age	Infant/Child - Exposure Information DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Infant/Child Cancer Risk (per million)	Adult - Exposure Information Modeled DPM Conc (ug/m3) Year	Annual	Age Sensitivity Factor	Adult Cancer Risk (per million)
0	0.25	-0.25 - 0*	-	-	10	-	-	-	-	-
1	1	0 - 1	2018	0.0081	10	1.32	2018	0.0081	1	0.03
2	1	1 - 2	2019	0.0389	10	6.38	2019	0.0389	1	0.14
3	1	2 - 3		0.0000	3	0.00		0.0000	1	0.00
4	1	3 - 4		0.0000	3	0.00		0.0000	1	0.00
5	1	4 - 5		0.0000	3	0.00		0.0000	1	0.00
6	1	5 - 6		0.0000	3	0.00		0.0000	1	0.00
7	1	6 - 7		0.0000	3	0.00		0.0000	1	0.00
8	1	7 - 8		0.0000	3	0.00		0.0000	1	0.00
9	1	8 - 9		0.0000	3	0.00		0.0000	1	0.00
10	1	9 - 10		0.0000	3	0.00		0.0000	1	0.00
11	1	10 - 11		0.0000	3	0.00		0.0000	1	0.00
12	1	11 - 12		0.0000	3	0.00		0.0000	1	0.00
13	1	12 - 13		0.0000	3	0.00		0.0000	1	0.00
14	1	13 - 14		0.0000	3	0.00		0.0000	1	0.00
15	1	14 - 15		0.0000	3	0.00		0.0000	1	0.00
16	1	15 - 16		0.0000	3	0.00		0.0000	1	0.00
17	1	16-17		0.0000	1	0.00		0.0000	1	0.00
18	1	17-18		0.0000	1	0.00		0.0000	1	0.00
19	1	18-19		0.0000	1	0.00		0.0000	1	0.00
20	1	19-20		0.0000	1	0.00		0.0000	1	0.00
21	1	20-21		0.0000	1	0.00		0.0000	1	0.00
22	1	21-22		0.0000	1	0.00		0.0000	1	0.00
23	1	22-23		0.0000	1	0.00		0.0000	1	0.00
24	1	23-24		0.0000	1	0.00		0.0000	1	0.00
25	1	24-25		0.0000	1	0.00		0.0000	1	0.00
26	1	25-26		0.0000	1	0.00		0.0000	1	0.00
27	1	26-27		0.0000	1	0.00		0.0000	1	0.00
28	1	27-28		0.0000	1	0.00		0.0000	1	0.00
29	1	28-29		0.0000	1	0.00		0.0000	1	0.00
30	1	29-30		0.0000	1	0.00		0.0000	1	0.00
Total Increased Cancer Risk						**7.7**				**0.2**

* Third trimester of pregnancy

UCSC Hagar site Daycare

Monterey Bay Unified APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	13.50	1000sqft	3.00	13,500.00	0

1.2 Other Project Characteristics

Urbanization Urban | **Wind Speed (m/s)** 2.8 | **Precipitation Freq (Days)** 53

Climate Zone 5 | **Operational Year** 2020

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 290 | **CH4 Intensity (lb/MWhr)** 0.029 | **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Assume PG&E 2020 rate

Land Use - Estimated acreage

Construction Phase - Based on construction schedule

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on Equipment list

Off-road Equipment - Based on Equipment list

Off-road Equipment - Based on Equipment list

Off-road Equipment - Based on Equipment list

Trips and VMT - On- and nearby-travel for TAC

Grading - Balanced site,but assumed 1,000cy import and export

Construction Off-road Equipment Mitigation - Tier 3 mobile/Tier 4 portable and BMPs

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	3.00	5.00
tblConstructionPhase	NumDays	6.00	10.00
tblConstructionPhase	NumDays	220.00	85.00
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	10.00	65.00
tblLandUse	LotAcreage	0.31	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	6.00	5.60

tblOffRoadEquipment	UsageHours	6.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripNumber	0.00	250.00

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	0.1805	0.9284	0.6014	1.2100e-003	0.0256	0.0431	0.0687	4.3200e-003	0.0404	0.0448	0.0000	109.5825	109.5825	0.0249	0.0000	110.2046
Maximum	**0.1805**	**0.9284**	**0.6014**	**1.2100e-003**	**0.0256**	**0.0431**	**0.0687**	**4.3200e-003**	**0.0404**	**0.0448**	**0.0000**	**109.5825**	**109.5825**	**0.0249**	**0.0000**	**110.2046**

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	0.1147	0.4550	0.5775	1.2100e-003	0.0169	0.0164	0.0333	3.3800e-003	0.0164	0.0198	0.0000	96.1118	96.1118	0.0239	0.0000	96.7089
Maximum	**0.1147**	**0.4550**	**0.5775**	**1.2100e-003**	**0.0169**	**0.0164**	**0.0333**	**3.3800e-003**	**0.0164**	**0.0198**	**0.0000**	**96.1118**	**96.1118**	**0.0239**	**0.0000**	**96.7089**

	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**	**N20**	**CO2e**
Percent Reduction	**36.44**	**50.99**	**3.97**	**0.00**	**33.92**	**61.93**	**51.50**	**21.76**	**59.47**	**55.83**	**0.00**	**12.29**	**12.29**	**4.02**	**0.00**	**12.25**

Quarter	**Start Date**	**End Date**	**Maximum Unmitigated ROG + NOX (tons/quarter)**	**Maximum Mitigated ROG + NOX (tons/quarter)**
1	**8-1-2018**	**9-30-2018**	0.6627	0.3322
		Highest	0.6627	0.3322

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	8/1/2018	8/7/2018	5	5	1 week
2	Grading	Grading	8/8/2018	8/21/2018	5	10	2 weeks
3	Building Construction	Building Construction	8/22/2018	12/18/2018	5	85	17 weeks - overlap
4	Paving	Paving	8/22/2018	8/28/2018	5	5	1 week - overlap
5	Architectural Coating	Architectural Coating	10/2/2018	12/31/2018	5	65	13 weeks - overlap

Acres of Grading (Site Preparation Phase): 5.25

Acres of Grading (Grading Phase): 24.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 20,250; Non-Residential Outdoor: 6,750; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Crawler Tractors	1	5.60	212	0.43
Site Preparation	Excavators	1	5.60	158	0.38
Site Preparation	Generator Sets	1	5.60	84	0.74
Site Preparation	Off-Highway Tractors	1	5.60	124	0.44
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Rubber Tired Loaders	1	5.60	203	0.36
Site Preparation	Scrapers	1	5.60	367	0.48
Site Preparation	Signal Boards	2	8.00	6	0.82
Site Preparation	Skid Steer Loaders	1	5.60	65	0.37
Site Preparation	Sweepers/Scrubbers	1	2.00	64	0.46
Site Preparation	Tractors/Loaders/Backhoes	0	5.60	97	0.37
Grading	Crawler Tractors	1	5.60	212	0.43
Grading	Excavators	2	5.60	158	0.38
Grading	Generator Sets	1	5.60	84	0.74
Grading	Graders	2	5.60	187	0.41
Grading	Off-Highway Tractors	2	5.60	124	0.44
Grading	Plate Compactors	2	5.60	8	0.43
Grading	Rollers	2	5.60	80	0.38
Grading	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Rubber Tired Loaders	2	5.60	203	0.36
Grading	Scrapers	2	5.60	367	0.48
Grading	Signal Boards	2	8.00	6	0.82
Grading	Skid Steer Loaders	1	5.60	65	0.37
Grading	Sweepers/Scrubbers	1	2.00	64	0.46
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Air Compressors	1	3.20	78	0.48
Building Construction	Cranes	2	3.20	231	0.29
Building Construction	Forklifts	0	8.00	89	0.20
Building Construction	Generator Sets	1	3.20	84	0.74
Building Construction	Rough Terrain Forklifts	2	3.20	100	0.40
Building Construction	Sweepers/Scrubbers	1	3.20	64	0.46
Building Construction	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Paving	Cement and Mortar Mixers	0	6.00	9	0.56
Paving	Pavers	1	5.60	130	0.42
Paving	Paving Equipment	1	5.60	132	0.36
Paving	Plate Compactors	2	5.60	8	0.43
Paving	Rollers	2	5.60	80	0.38
Paving	Signal Boards	2	8.00	6	0.82
Paving	Skid Steer Loaders	1	5.60	65	0.37
Paving	Sweepers/Scrubbers	1	2.00	64	0.46
Paving	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Architectural Coating	Aerial Lifts	1	1.20	63	0.31
Architectural Coating	Air Compressors	0	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
Site Preparation	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	20	50.00	0.00	250.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	6.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved 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					2.7800e-003	0.0000	2.7800e-003	3.0000e-004	0.0000	3.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.4400e-003	0.0731	0.0460	9.0000e-005		3.1900e-003	3.1900e-003		2.9700e-003	2.9700e-003	0.0000	7.9372	7.9372	2.1900e-003	0.0000	7.9919
Total	**6.4400e-003**	**0.0731**	**0.0460**	**9.0000e-005**	**2.7800e-003**	**3.1900e-003**	**5.9700e-003**	**3.0000e-004**	**2.9700e-003**	**3.2700e-003**	**0.0000**	**7.9372**	**7.9372**	**2.1900e-003**	**0.0000**	**7.9919**

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	3.3000e-004	3.2000e-004	2.8400e-003	1.0000e-005	5.0000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.4000e-004	0.0000	0.4900	0.4900	3.0000e-005	0.0000	0.4907
Total	**3.3000e-004**	**3.2000e-004**	**2.8400e-003**	**1.0000e-005**	**5.0000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.4900**	**0.4900**	**3.0000e-005**	**0.0000**	**0.4907**

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					1.2500e-003	0.0000	1.2500e-003	1.4000e-004	0.0000	1.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8100e-003	0.0355	0.0444	9.0000e-005		1.5300e-003	1.5300e-003		1.5300e-003	1.5300e-003	0.0000	6.7244	6.7244	2.0900e-003	0.0000	6.7767

Total	**1.8100e-003**	**0.0355**	**0.0444**	**9.0000e-005**	**1.2500e-003**	**1.5300e-003**	**2.7800e-003**	**1.4000e-004**	**1.5300e-003**	**1.6700e-003**	**0.0000**	**6.7244**	**6.7244**	**2.0900e-003**	**0.0000**	**6.7767**

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	3.3000e-004	3.2000e-004	2.8400e-003	1.0000e-005	5.0000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.4000e-004	0.0000	0.4900	0.4900	3.0000e-005	0.0000	0.4907
Total	**3.3000e-004**	**3.2000e-004**	**2.8400e-003**	**1.0000e-005**	**5.0000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.4900**	**0.4900**	**3.0000e-005**	**0.0000**	**0.4907**

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					0.0130	0.0000	0.0130	1.4000e-003	0.0000	1.4000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0262	0.3063	0.1795	3.6000e-004		0.0130	0.0130		0.0120	0.0120	0.0000	32.0126	32.0126	9.3500e-003	0.0000	32.2465
Total	**0.0262**	**0.3063**	**0.1795**	**3.6000e-004**	**0.0130**	**0.0130**	**0.0260**	**1.4000e-003**	**0.0120**	**0.0134**	**0.0000**	**32.0126**	**32.0126**	**9.3500e-003**	**0.0000**	**32.2465**

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	1.3200e-003	0.0424	7.5700e-003	1.0000e-004	2.1200e-003	2.5000e-004	2.3800e-003	5.8000e-004	2.4000e-004	8.3000e-004	0.0000	9.8535	9.8535	4.2000e-004	0.0000	9.8640
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	1.3400e-003	1.2800e-003	0.0114	2.0000e-005	1.9900e-003	2.0000e-005	2.0100e-003	5.3000e-004	2.0000e-005	5.5000e-004	0.0000	1.9601	1.9601	1.0000e-004	0.0000	1.9626
Total	**2.6600e-003**	**0.0437**	**0.0189**	**1.2000e-004**	**4.1100e-003**	**2.7000e-004**	**4.3900e-003**	**1.1100e-003**	**2.6000e-004**	**1.3800e-003**	**0.0000**	**11.8136**	**11.8136**	**5.2000e-004**	**0.0000**	**11.8266**

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					5.8500e-003	0.0000	5.8500e-003	6.3000e-004	0.0000	6.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.9100e-003	0.1554	0.1934	3.6000e-004		6.7500e-003	6.7500e-003		6.7500e-003	6.7500e-003	0.0000	29.5870	29.5870	9.1700e-003	0.0000	29.8161

Total	**7.9100e-003**	**0.1554**	**0.1934**	**3.6000e-004**	**5.8500e-003**	**6.7500e-003**	**0.0126**	**6.3000e-004**	**6.7500e-003**	**7.3800e-003**	**0.0000**	**29.5870**	**29.5870**	**9.1700e-003**	**0.0000**	**29.8161**

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	1.3200e-003	0.0424	7.5700e-003	1.0000e-004	2.1200e-003	2.5000e-004	2.3800e-003	5.8000e-004	2.4000e-004	8.3000e-004	0.0000	9.8535	9.8535	4.2000e-004	0.0000	9.8640
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	1.3400e-003	1.2800e-003	0.0114	2.0000e-005	1.9900e-003	2.0000e-005	2.0100e-003	5.3000e-004	2.0000e-005	5.5000e-004	0.0000	1.9601	1.9601	1.0000e-004	0.0000	1.9626
Total	**2.6600e-003**	**0.0437**	**0.0189**	**1.2000e-004**	**4.1100e-003**	**2.7000e-004**	**4.3900e-003**	**1.1100e-003**	**2.6000e-004**	**1.3800e-003**	**0.0000**	**11.8136**	**11.8136**	**5.2000e-004**	**0.0000**	**11.8266**

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	0.0454	0.4609	0.3042	5.4000e-004		0.0250	0.0250		0.0236	0.0236	0.0000	47.9370	47.9370	0.0114	0.0000	48.2213
Total	**0.0454**	**0.4609**	**0.3042**	**5.4000e-004**		**0.0250**	**0.0250**		**0.0236**	**0.0236**	**0.0000**	**47.9370**	**47.9370**	**0.0114**	**0.0000**	**48.2213**

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	5.5000e-004	0.0124	3.5400e-003	2.0000e-005	5.6000e-004	1.1000e-004	6.8000e-004	1.6000e-004	1.1000e-004	2.7000e-004	0.0000	2.3430	2.3430	1.4000e-004	0.0000	2.3466
Worker	1.3600e-003	1.3000e-003	0.0116	2.0000e-005	2.0300e-003	2.0000e-005	2.0500e-003	5.4000e-004	2.0000e-005	5.6000e-004	0.0000	1.9993	1.9993	1.0000e-004	0.0000	2.0019
Total	**1.9100e-003**	**0.0137**	**0.0151**	**4.0000e-005**	**2.5900e-003**	**1.3000e-004**	**2.7300e-003**	**7.0000e-004**	**1.3000e-004**	**8.3000e-004**	**0.0000**	**4.3423**	**4.3423**	**2.4000e-004**	**0.0000**	**4.3484**

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	4.4600e-003	0.1857	0.2669	5.4000e-004		6.6000e-003	6.6000e-003		6.6000e-003	6.6000e-003	0.0000	38.3284	38.3284	0.0107	0.0000	38.5954
Total	**4.4600e-003**	**0.1857**	**0.2669**	**5.4000e-004**		**6.6000e-003**	**6.6000e-003**		**6.6000e-003**	**6.6000e-003**	**0.0000**	**38.3284**	**38.3284**	**0.0107**	**0.0000**	**38.5954**

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	5.5000e-004	0.0124	3.5400e-003	2.0000e-005	5.6000e-004	1.1000e-004	6.8000e-004	1.6000e-004	1.1000e-004	2.7000e-004	0.0000	2.3430	2.3430	1.4000e-004	0.0000	2.3466
Worker	1.3600e-003	1.3000e-003	0.0116	2.0000e-005	2.0300e-003	2.0000e-005	2.0500e-003	5.4000e-004	2.0000e-005	5.6000e-004	0.0000	1.9993	1.9993	1.0000e-004	0.0000	2.0019
Total	**1.9100e-003**	**0.0137**	**0.0151**	**4.0000e-005**	**2.5900e-003**	**1.3000e-004**	**2.7300e-003**	**7.0000e-004**	**1.3000e-004**	**8.3000e-004**	**0.0000**	**4.3423**	**4.3423**	**2.4000e-004**	**0.0000**	**4.3484**

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	2.6700e-003	0.0262	0.0223	3.0000e-005		1.4800e-003	1.4800e-003		1.3700e-003	1.3700e-003	0.0000	3.0482	3.0482	8.8000e-004	0.0000	3.0702
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.6700e-003**	**0.0262**	**0.0223**	**3.0000e-005**		**1.4800e-003**	**1.4800e-003**		**1.3700e-003**	**1.3700e-003**	**0.0000**	**3.0482**	**3.0482**	**8.8000e-004**	**0.0000**	**3.0702**

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	3.3000e-004	3.2000e-004	2.8400e-003	1.0000e-005	5.0000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.4000e-004	0.0000	0.4900	0.4900	3.0000e-005	0.0000	0.4907
Total	**3.3000e-004**	**3.2000e-004**	**2.8400e-003**	**1.0000e-005**	**5.0000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.4900**	**0.4900**	**3.0000e-005**	**0.0000**	**0.4907**

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	7.3000e-004	0.0154	0.0226	3.0000e-005		9.2000e-004	9.2000e-004		9.2000e-004	9.2000e-004	0.0000	2.8245	2.8245	8.6000e-004	0.0000	2.8459
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	**7.3000e-004**	**0.0154**	**0.0226**	**3.0000e-005**		**9.2000e-004**	**9.2000e-004**		**9.2000e-004**	**9.2000e-004**	**0.0000**	**2.8245**	**2.8245**	**8.6000e-004**	**0.0000**	**2.8459**

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	3.3000e-004	3.2000e-004	2.8400e-003	1.0000e-005	5.0000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.4000e-004	0.0000	0.4900	0.4900	3.0000e-005	0.0000	0.4907
Total	**3.3000e-004**	**3.2000e-004**	**2.8400e-003**	**1.0000e-005**	**5.0000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.4900**	**0.4900**	**3.0000e-005**	**0.0000**	**0.4907**

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	0.0939					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0000e-004	3.4700e-003	5.3200e-003	1.0000e-005		1.0000e-004	1.0000e-004		9.0000e-005	9.0000e-005	0.0000	0.7472	0.7472	2.3000e-004	0.0000	0.7530
Total	**0.0941**	**3.4700e-003**	**5.3200e-003**	**1.0000e-005**		**1.0000e-004**	**1.0000e-004**		**9.0000e-005**	**9.0000e-005**	**0.0000**	**0.7472**	**0.7472**	**2.3000e-004**	**0.0000**	**0.7530**

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	5.2000e-004	5.0000e-004	4.4300e-003	1.0000e-005	2.1200e-003	1.0000e-005	2.1200e-003	5.4000e-004	1.0000e-005	5.4000e-004	0.0000	0.7644	0.7644	4.0000e-005	0.0000	0.7654
Total	**5.2000e-004**	**5.0000e-004**	**4.4300e-003**	**1.0000e-005**	**2.1200e-003**	**1.0000e-005**	**2.1200e-003**	**5.4000e-004**	**1.0000e-005**	**5.4000e-004**	**0.0000**	**0.7644**	**0.7644**	**4.0000e-005**	**0.0000**	**0.7654**

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	0.0939					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0000e-004	4.6000e-003	6.2100e-003	1.0000e-005		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	0.7472	0.7472	2.3000e-004	0.0000	0.7530

Total	**0.0941**	**4.6000e-003**	**6.2100e-003**	**1.0000e-005**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**	**0.0000**	**0.7472**	**0.7472**	**2.3000e-004**	**0.0000**	**0.7530**

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	5.2000e-004	5.0000e-004	4.4300e-003	1.0000e-005	2.1200e-003	1.0000e-005	2.1200e-003	5.4000e-004	1.0000e-005	5.4000e-004	0.0000	0.7644	0.7644	4.0000e-005	0.0000	0.7654
Total	**5.2000e-004**	**5.0000e-004**	**4.4300e-003**	**1.0000e-005**	**2.1200e-003**	**1.0000e-005**	**2.1200e-003**	**5.4000e-004**	**1.0000e-005**	**5.4000e-004**	**0.0000**	**0.7644**	**0.7644**	**4.0000e-005**	**0.0000**	**0.7654**

UCSC Hagar site Daycare

Monterey Bay Unified APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	13.50	1000sqft	3.00	13,500.00	0

1.2 Other Project Characteristics

Urbanization Urban

Wind Speed (m/s) 2.8

Precipitation Freq (Days) 53

Climate Zone 5

Operational Year 2020

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 290

CH4 Intensity (lb/MWhr) 0.029

N2O Intensity (lb/MWhr) 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Assume PG&E 2020 rate

Land Use - Estimated acreage

Construction Phase - Based on construction schedule

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on Equipment list

Off-road Equipment - Based on Equipment list

Off-road Equipment - Based on Equipment list

Off-road Equipment - Based on Equipment list

Trips and VMT - On- and nearby-travel for TAC

Grading - Balanced site,but assumed 1,000cy import and export

Construction Off-road Equipment Mitigation - Tier 3 mobile/Tier 4 portable and BMPs

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	3.00	5.00
tblConstructionPhase	NumDays	6.00	10.00
tblConstructionPhase	NumDays	220.00	85.00
tblConstructionPhase	NumDays	10.00	5.00
tblConstructionPhase	NumDays	10.00	65.00
tblLandUse	LotAcreage	0.31	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	6.00	5.60
tblOffRoadEquipment	UsageHours	6.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripNumber	0.00	250.00

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	5.7688	69.7860	39.7145	0.0964	3.4458	2.6483	6.0941	0.5092	2.4563	2.9655	0.0000	9,706.2589	9,706.2589	2.1744	0.0000	9,760.6197
Maximum	**5.7688**	**69.7860**	**39.7145**	**0.0964**	**3.4458**	**2.6483**	**6.0941**	**0.5092**	**2.4563**	**2.9655**	**0.0000**	**9,706.2589**	**9,706.2589**	**2.1744**	**0.0000**	**9,760.6197**

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	3.0600	39.5999	42.4866	0.0964	2.0168	1.4039	3.4207	0.3549	1.4014	1.7563	0.0000	9,171.5076	9,171.5076	2.1327	0.0000	9,224.8258
Maximum	**3.0600**	**39.5999**	**42.4866**	**0.0964**	**2.0168**	**1.4039**	**3.4207**	**0.3549**	**1.4014**	**1.7563**	**0.0000**	**9,171.5076**	**9,171.5076**	**2.1327**	**0.0000**	**9,224.8258**

	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**	**N20**	**CO2e**
Percent Reduction	**46.96**	**43.26**	**-6.98**	**0.00**	**41.47**	**46.99**	**43.87**	**30.30**	**42.95**	**40.77**	**0.00**	**5.51**	**5.51**	**1.92**	**0.00**	**5.49**

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	8/1/2018	8/7/2018	5	5	1 week
2	Grading	Grading	8/8/2018	8/21/2018	5	10	2 weeks
3	Building Construction	Building Construction	8/22/2018	12/18/2018	5	85	17 weeks - overlap
4	Paving	Paving	8/22/2018	8/28/2018	5	5	1 week - overlap
5	Architectural Coating	Architectural Coating	10/2/2018	12/31/2018	5	65	13 weeks - overlap

Acres of Grading (Site Preparation Phase): 5.25

Acres of Grading (Grading Phase): 24.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 20,250; Non-Residential Outdoor: 6,750; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Crawler Tractors	1	5.60	212	0.43
Site Preparation	Excavators	1	5.60	158	0.38
Site Preparation	Generator Sets	1	5.60	84	0.74
Site Preparation	Off-Highway Tractors	1	5.60	124	0.44
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Rubber Tired Loaders	1	5.60	203	0.36
Site Preparation	Scrapers	1	5.60	367	0.48
Site Preparation	Signal Boards	2	8.00	6	0.82
Site Preparation	Skid Steer Loaders	1	5.60	65	0.37
Site Preparation	Sweepers/Scrubbers	1	2.00	64	0.46
Site Preparation	Tractors/Loaders/Backhoes	0	5.60	97	0.37
Grading	Crawler Tractors	1	5.60	212	0.43
Grading	Excavators	2	5.60	158	0.38
Grading	Generator Sets	1	5.60	84	0.74
Grading	Graders	2	5.60	187	0.41
Grading	Off-Highway Tractors	2	5.60	124	0.44
Grading	Plate Compactors	2	5.60	8	0.43
Grading	Rollers	2	5.60	80	0.38
Grading	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Rubber Tired Loaders	2	5.60	203	0.36
Grading	Scrapers	2	5.60	367	0.48
Grading	Signal Boards	2	8.00	6	0.82
Grading	Skid Steer Loaders	1	5.60	65	0.37
Grading	Sweepers/Scrubbers	1	2.00	64	0.46
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Air Compressors	1	3.20	78	0.48
Building Construction	Cranes	2	3.20	231	0.29
Building Construction	Forklifts	0	8.00	89	0.20

Building Construction	Generator Sets	1	3.20	84	0.74
Building Construction	Rough Terrain Forklifts	2	3.20	100	0.40
Building Construction	Sweepers/Scrubbers	1	3.20	64	0.46
Building Construction	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Paving	Cement and Mortar Mixers	0	6.00	9	0.56
Paving	Pavers	1	5.60	130	0.42
Paving	Paving Equipment	1	5.60	132	0.36
Paving	Plate Compactors	2	5.60	8	0.43
Paving	Rollers	2	5.60	80	0.38
Paving	Signal Boards	2	8.00	6	0.82
Paving	Skid Steer Loaders	1	5.60	65	0.37
Paving	Sweepers/Scrubbers	1	2.00	64	0.46
Paving	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Architectural Coating	Aerial Lifts	1	1.20	63	0.31
Architectural Coating	Air Compressors	0	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
Site Preparation	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	20	50.00	0.00	250.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	6.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved 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					1.1135	0.0000	1.1135	0.1202	0.0000	0.1202			0.0000			0.0000
Off-Road	2.5769	29.2519	18.3913	0.0355		1.2750	1.2750		1.1899	1.1899		3,499.7018	3,499.7018	0.9647		3,523.8201
Total	**2.5769**	**29.2519**	**18.3913**	**0.0355**	**1.1135**	**1.2750**	**2.3885**	**0.1202**	**1.1899**	**1.3102**		**3,499.7018**	**3,499.7018**	**0.9647**		**3,523.8201**

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	0.1340	0.1120	1.1806	2.3000e-003	0.2054	1.8500e-003	0.2072	0.0545	1.7100e-003	0.0562		228.7918	228.7918	0.0116		229.0823
Total	**0.1340**	**0.1120**	**1.1806**	**2.3000e-003**	**0.2054**	**1.8500e-003**	**0.2072**	**0.0545**	**1.7100e-003**	**0.0562**		**228.7918**	**228.7918**	**0.0116**		**229.0823**

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					0.5011	0.0000	0.5011	0.0541	0.0000	0.0541			0.0000			0.0000
Off-Road	0.7253	14.2016	17.7404	0.0355		0.6102	0.6102		0.6102	0.6102	0.0000	2,964.950 5	2,964.9505	0.9230		2,988.026 2
Total	**0.7253**	**14.2016**	**17.7404**	**0.0355**	**0.5011**	**0.6102**	**1.1113**	**0.0541**	**0.6102**	**0.6643**	**0.0000**	**2,964.950 5**	**2,964.9505**	**0.9230**		**2,988.026 2**

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	0.1340	0.1120	1.1806	2.3000e-003	0.2054	1.8500e-003	0.2072	0.0545	1.7100e-003	0.0562		228.7918	228.7918	0.0116		229.0823
Total	**0.1340**	**0.1120**	**1.1806**	**2.3000e-003**	**0.2054**	**1.8500e-003**	**0.2072**	**0.0545**	**1.7100e-003**	**0.0562**		**228.7918**	**228.7918**	**0.0116**		**229.0823**

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					2.5982	0.0000	2.5982	0.2806	0.0000	0.2806			0.0000			0.0000
Off-Road	5.2399	61.2576	35.9031	0.0710		2.5946	2.5946		2.4051	2.4051		7,057.5680	7,057.5680	2.0623		7,109.1262
Total	**5.2399**	**61.2576**	**35.9031**	**0.0710**	**2.5982**	**2.5946**	**5.1929**	**0.2806**	**2.4051**	**2.6856**		**7,057.5680**	**7,057.5680**	**2.0623**		**7,109.1262**

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	0.2610	8.3044	1.4502	0.0208	0.4369	0.0500	0.4868	0.1197	0.0478	0.1675		2,191.1073	2,191.1073	0.0889		2,193.3288
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	0.2679	0.2240	2.3612	4.6100e-003	0.4107	3.6900e-003	0.4144	0.1090	3.4100e-003	0.1124		457.5836	457.5836	0.0233		458.1647
Total	**0.5290**	**8.5283**	**3.8115**	**0.0254**	**0.8476**	**0.0537**	**0.9013**	**0.2287**	**0.0512**	**0.2799**		**2,648.6909**	**2,648.6909**	**0.1121**		**2,651.4935**

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					1.1692	0.0000	1.1692	0.1263	0.0000	0.1263			0.0000			0.0000
Off-Road	1.5816	31.0716	38.6752	0.0710		1.3502	1.3502		1.3502	1.3502	0.0000	6,522.8167	6,522.8167	2.0206		6,573.3323

Total	**1.5816**	**31.0716**	**38.6752**	**0.0710**	**1.1692**	**1.3502**	**2.5194**	**0.1263**	**1.3502**	**1.4764**	**0.0000**	**6,522.8167**	**6,522.8167**	**2.0206**		**6,573.3323**

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	0.2610	8.3044	1.4502	0.0208	0.4369	0.0500	0.4868	0.1197	0.0478	0.1675		2,191.1073	2,191.1073	0.0889		2,193.3288
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	0.2679	0.2240	2.3612	4.6100e-003	0.4107	3.6900e-003	0.4144	0.1090	3.4100e-003	0.1124		457.5836	457.5836	0.0233		458.1647
Total	**0.5290**	**8.5283**	**3.8115**	**0.0254**	**0.8476**	**0.0537**	**0.9013**	**0.2287**	**0.0512**	**0.2799**		**2,648.6909**	**2,648.6909**	**0.1121**		**2,651.4935**

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	1.0679	10.8441	7.1569	0.0126		0.5870	0.5870		0.5548	0.5548		1,243.3292	1,243.3292	0.2950		1,250.7041
Total	**1.0679**	**10.8441**	**7.1569**	**0.0126**		**0.5870**	**0.5870**		**0.5548**	**0.5548**		**1,243.3292**	**1,243.3292**	**0.2950**		**1,250.7041**

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	0.0127	0.2866	0.0782	5.9000e-004	0.0135	2.6800e-003	0.0162	3.9000e-003	2.5600e-003	6.4600e-003		61.5430	61.5430	3.5200e-003		61.6311
Worker	0.0322	0.0269	0.2834	5.5000e-004	0.0493	4.4000e-004	0.0497	0.0131	4.1000e-004	0.0135		54.9100	54.9100	2.7900e-003		54.9798
Total	**0.0448**	**0.3135**	**0.3616**	**1.1400e-003**	**0.0628**	**3.1200e-003**	**0.0660**	**0.0170**	**2.9700e-003**	**0.0199**		**116.4531**	**116.4531**	**6.3100e-003**		**116.6109**

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	0.1049	4.3691	6.2799	0.0126		0.1554	0.1554		0.1554	0.1554	0.0000	994.1154	994.1154	0.2770		1,001.0408
Total	**0.1049**	**4.3691**	**6.2799**	**0.0126**		**0.1554**	**0.1554**		**0.1554**	**0.1554**	**0.0000**	**994.1154**	**994.1154**	**0.2770**		**1,001.0408**

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	0.0127	0.2866	0.0782	5.9000e-004	0.0135	2.6800e-003	0.0162	3.9000e-003	2.5600e-003	6.4600e-003		61.5430	61.5430	3.5200e-003		61.6311
Worker	0.0322	0.0269	0.2834	5.5000e-004	0.0493	4.4000e-004	0.0497	0.0131	4.1000e-004	0.0135		54.9100	54.9100	2.7900e-003		54.9798
Total	**0.0448**	**0.3135**	**0.3616**	**1.1400e-003**	**0.0628**	**3.1200e-003**	**0.0660**	**0.0170**	**2.9700e-003**	**0.0199**		**116.4531**	**116.4531**	**6.3100e-003**		**116.6109**

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	1.0686	10.4643	8.9087	0.0140		0.5935	0.5935		0.5493	0.5493		1,344.0192	1,344.0192	0.3879		1,353.7174
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0686**	**10.4643**	**8.9087**	**0.0140**		**0.5935**	**0.5935**		**0.5493**	**0.5493**		**1,344.0192**	**1,344.0192**	**0.3879**		**1,353.7174**

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	0.1340	0.1120	1.1806	2.3000e-003	0.2054	1.8500e-003	0.2072	0.0545	1.7100e-003	0.0562		228.7918	228.7918	0.0116		229.0823
Total	**0.1340**	**0.1120**	**1.1806**	**2.3000e-003**	**0.2054**	**1.8500e-003**	**0.2072**	**0.0545**	**1.7100e-003**	**0.0562**		**228.7918**	**228.7918**	**0.0116**		**229.0823**

Mitigated Construction On-Site

Category	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
	lb/day										lb/day					
Off-Road	0.2926	6.1509	9.0210	0.0140		0.3673	0.3673		0.3673	0.3673	0.0000	1,245.3921	1,245.3921	0.3777		1,254.8344
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.2926**	**6.1509**	**9.0210**	**0.0140**		**0.3673**	**0.3673**		**0.3673**	**0.3673**	**0.0000**	**1,245.3921**	**1,245.3921**	**0.3777**		**1,254.8344**

Mitigated Construction Off-Site

Category	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
	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	0.1340	0.1120	1.1806	2.3000e-003	0.2054	1.8500e-003	0.2072	0.0545	1.7100e-003	0.0562		228.7918	228.7918	0.0116		229.0823
Total	**0.1340**	**0.1120**	**1.1806**	**2.3000e-003**	**0.2054**	**1.8500e-003**	**0.2072**	**0.0545**	**1.7100e-003**	**0.0562**		**228.7918**	**228.7918**	**0.0116**		**229.0823**

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	2.8880					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	6.3000e-003	0.1066	0.1636	2.5000e-004		2.9500e-003	2.9500e-003		2.7100e-003	2.7100e-003		25.3416	25.3416	7.8900e-003		25.5388
Total	**2.8943**	**0.1066**	**0.1636**	**2.5000e-004**		**2.9500e-003**	**2.9500e-003**		**2.7100e-003**	**2.7100e-003**		**25.3416**	**25.3416**	**7.8900e-003**		**25.5388**

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	0.0161	0.0134	0.1417	2.8000e-004	0.0675	2.2000e-004	0.0677	0.0171	2.0000e-004	0.0173		27.4550	27.4550	1.3900e-003		27.4899
Total	**0.0161**	**0.0134**	**0.1417**	**2.8000e-004**	**0.0675**	**2.2000e-004**	**0.0677**	**0.0171**	**2.0000e-004**	**0.0173**		**27.4550**	**27.4550**	**1.3900e-003**		**27.4899**

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	2.8880					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Off-Road	6.2000e-003	0.1416	0.1912	2.5000e-004		5.7900e-003	5.7900e-003		5.7900e-003	5.7900e-003	0.0000	25.3416	25.3416	7.8900e-003		25.5388
Total	**2.8942**	**0.1416**	**0.1912**	**2.5000e-004**		**5.7900e-003**	**5.7900e-003**		**5.7900e-003**	**5.7900e-003**	**0.0000**	**25.3416**	**25.3416**	**7.8900e-003**		**25.5388**

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	0.0161	0.0134	0.1417	2.8000e-004	0.0675	2.2000e-004	0.0677	0.0171	2.0000e-004	0.0173		27.4550	27.4550	1.3900e-003		27.4899
Total	**0.0161**	**0.0134**	**0.1417**	**2.8000e-004**	**0.0675**	**2.2000e-004**	**0.0677**	**0.0171**	**2.0000e-004**	**0.0173**		**27.4550**	**27.4550**	**1.3900e-003**		**27.4899**

UCSC Student Housing

Monterey Bay Unified APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	30.00	Space	0.00	12,000.00	0
Apartments Mid Rise	148.00	Dwelling Unit	3.89	146,100.00	423

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.8	**Precipitation Freq (Days)**	53
Climate Zone	5			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 Emission Rate

Land Use - From project description, added community center sf to residential. Estiamted arcreage as this does not include childcare

Construction Phase - Adjusted schedule to project

Off-road Equipment - Based on provided list

Off-road Equipment - Based on provided list

Off-road Equipment - Based on provided list

Off-road Equipment - Based on provided list

Off-road Equipment - Based on provided list

Demolition -

Grading - Assumed balance but included 1,000cy import/export

Construction Off-road Equipment Mitigation - Tier 3 Mobile/Tier 4 Portable/BMPs for fugitive dust

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	5.00	10.00
tblConstructionPhase	NumDays	8.00	20.00
tblConstructionPhase	NumDays	18.00	20.00
tblConstructionPhase	NumDays	18.00	20.00
tblLandUse	LandUseSquareFeet	148,000.00	146,100.00
tblLandUse	LotAcreage	0.27	0.00
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	7.00	3.20
tblOffRoadEquipment	UsageHours	8.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	6.00	5.60
tblOffRoadEquipment	UsageHours	6.00	5.60
tblProjectCharacteristics	CO2IntensityFactor	641.35	290

tblTripsAndVMT	HaulingTripNumber	0.00	250.00
tblTripsAndVMT	WorkerTripNumber	30.00	23.00

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	0.1027	1.0743	0.7495	1.5800e-003	0.0568	0.0442	0.1010	0.0102	0.0412	0.0514	0.0000	143.7044	143.7044	0.0313	0.0000	144.4860
2019	1.0928	1.4741	1.4837	3.1300e-003	0.1015	0.0624	0.1640	0.0273	0.0588	0.0861	0.0000	281.9718	281.9718	0.0447	0.0000	283.0880
Maximum	**1.0928**	**1.4741**	**1.4837**	**3.1300e-003**	**0.1015**	**0.0624**	**0.1640**	**0.0273**	**0.0588**	**0.0861**	**0.0000**	**281.9718**	**281.9718**	**0.0447**	**0.0000**	**283.0880**

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	0.0433	0.5960	0.7568	1.5800e-003	0.0395	0.0218	0.0613	8.3200e-003	0.0217	0.0300	0.0000	132.7606	132.7606	0.0304	0.0000	133.5217
2019	1.0127	0.9131	1.4537	3.1300e-003	0.1015	0.0300	0.1315	0.0273	0.0297	0.0570	0.0000	259.4153	259.4153	0.0432	0.0000	260.4951
Maximum	**1.0127**	**0.9131**	**1.4537**	**3.1300e-003**	**0.1015**	**0.0300**	**0.1315**	**0.0273**	**0.0297**	**0.0570**	**0.0000**	**259.4153**	**259.4153**	**0.0432**	**0.0000**	**260.4951**

	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**	**N20**	**CO2e**
Percent Reduction	**11.67**	**40.78**	**1.02**	**0.00**	**10.96**	**51.47**	**27.26**	**4.99**	**48.65**	**36.76**	**0.00**	**7.87**	**7.87**	**3.00**	**0.00**	**7.85**

Quarter	**Start Date**	**End Date**	**Maximum Unmitigated ROG + NOX (tons/quarter)**	**Maximum Mitigated ROG + NOX (tons/quarter)**
1	**10-1-2018**	**12-31-2018**	1.1669	0.6364
2	**1-1-2019**	**3-31-2019**	0.5008	0.3016
3	**4-1-2019**	**6-30-2019**	0.5000	0.2985
4	**7-1-2019**	**9-30-2019**	0.5046	0.3032
		Highest	1.1669	0.6364

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	10/1/2018	10/12/2018	5	10	2 weeks
2	Grading	Grading	10/13/2018	11/9/2018	5	20	8 weeks
3	Building Construction	Building Construction	11/10/2018	9/27/2019	5	230	44 weeks - overlap
4	Paving	Paving	9/28/2019	10/25/2019	5	20	1 week - overlap
5	Architectural Coating	Architectural Coating	10/26/2019	11/22/2019	5	20	36 weeks - overlap

Acres of Grading (Site Preparation Phase): 10.5

Acres of Grading (Grading Phase): 49

Acres of Paving: 0

Residential Indoor: 295,853; Residential Outdoor: 98,618; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Crawler Tractors	1	5.60	212	0.43
Site Preparation	Excavators	1	5.60	158	0.38
Site Preparation	Generator Sets	1	5.60	84	0.74
Site Preparation	Off-Highway Tractors	1	5.60	124	0.44
Site Preparation	Rubber Tired Dozers	0	5.60	247	0.40
Site Preparation	Scrapers	1	5.60	367	0.48
Site Preparation	Signal Boards	2	5.60	6	0.82
Site Preparation	Skid Steer Loaders	1	5.60	65	0.37
Site Preparation	Sweepers/Scrubbers	1	2.00	64	0.46
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Grading	Crawler Tractors	1	5.60	212	0.43
Grading	Excavators	2	5.60	158	0.38
Grading	Generator Sets	1	5.60	84	0.74
Grading	Graders	2	5.60	187	0.41
Grading	Off-Highway Tractors	2	5.60	124	0.44
Grading	Plate Compactors	2	5.60	8	0.43
Grading	Rollers	2	5.60	80	0.38
Grading	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Rubber Tired Loaders	2	5.60	203	0.36
Grading	Scrapers	2	5.60	367	0.48
Grading	Signal Boards	2	5.60	6	0.82
Grading	Skid Steer Loaders	1	5.60	65	0.37
Grading	Sweepers/Scrubbers	1	2.00	64	0.46
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Aerial Lifts	4	3.20	63	0.31
Building Construction	Air Compressors	1	3.20	78	0.48
Building Construction	Cranes	2	3.20	231	0.29
Building Construction	Forklifts	0	8.00	89	0.20
Building Construction	Generator Sets	1	3.20	84	0.74
Building Construction	Rough Terrain Forklifts	2	3.20	100	0.40
Building Construction	Sweepers/Scrubbers	1	3.20	64	0.46
Building Construction	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	1.20	63	0.31
Architectural Coating	Air Compressors	0	6.00	78	0.48
Paving	Pavers	1	5.60	130	0.42
Paving	Paving Equipment	1	5.60	132	0.36
Paving	Plate Compactors	1	5.60	8	0.43
Paving	Rollers	2	5.60	80	0.38
Paving	Signal Boards	2	5.60	6	0.82
Paving	Skid Steer Loaders	1	5.60	65	0.37
Paving	Sweepers/Scrubbers	1	5.60	64	0.46
Site Preparation	Rubber Tired Loaders	1	5.60	203	0.36
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

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
Site Preparation	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	20	50.00	0.00	250.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	11	112.00	18.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	12	23.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	22.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved 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					5.5700e-003	0.0000	5.5700e-003	6.0000e-004	0.0000	6.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0127	0.1452	0.0911	1.8000e-004		6.3300e-003	6.3300e-003		5.9100e-003	5.9100e-003	0.0000	15.7402	15.7402	4.3600e-003	0.0000	15.8492
Total	**0.0127**	**0.1452**	**0.0911**	**1.8000e-004**	**5.5700e-003**	**6.3300e-003**	**0.0119**	**6.0000e-004**	**5.9100e-003**	**6.5100e-003**	**0.0000**	**15.7402**	**15.7402**	**4.3600e-003**	**0.0000**	**15.8492**

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	6.7000e-004	6.4000e-004	5.6800e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.9800	0.9800	5.0000e-005	0.0000	0.9813
Total	**6.7000e-004**	**6.4000e-004**	**5.6800e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.9800**	**0.9800**	**5.0000e-005**	**0.0000**	**0.9813**

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					2.5100e-003	0.0000	2.5100e-003	2.7000e-004	0.0000	2.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.9500e-003	0.0738	0.0868	1.8000e-004		3.1300e-003	3.1300e-003		3.1100e-003	3.1100e-003	0.0000	13.4488	13.4488	4.1900e-003	0.0000	13.5534

Total	3.9500e-003	0.0738	0.0868	1.8000e-004	2.5100e-003	3.1300e-003	5.6400e-003	2.7000e-004	3.1100e-003	3.3800e-003	0.0000	13.4488	13.4488	4.1900e-003	0.0000	13.5534

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	6.7000e-004	6.4000e-004	5.6800e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.9800	0.9800	5.0000e-005	0.0000	0.9813
Total	**6.7000e-004**	**6.4000e-004**	**5.6800e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.9800**	**0.9800**	**5.0000e-005**	**0.0000**	**0.9813**

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					0.0260	0.0000	0.0260	2.8100e-003	0.0000	2.8100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0521	0.6104	0.3572	7.1000e-004		0.0259	0.0259		0.0240	0.0240	0.0000	63.7568	63.7568	0.0187	0.0000	64.2238
Total	**0.0521**	**0.6104**	**0.3572**	**7.1000e-004**	**0.0260**	**0.0259**	**0.0518**	**2.8100e-003**	**0.0240**	**0.0268**	**0.0000**	**63.7568**	**63.7568**	**0.0187**	**0.0000**	**64.2238**

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	1.3200e-003	0.0424	7.5700e-003	1.0000e-004	2.1200e-003	2.5000e-004	2.3800e-003	5.8000e-004	2.4000e-004	8.3000e-004	0.0000	9.8535	9.8535	4.2000e-004	0.0000	9.8640
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	2.6700e-003	2.5600e-003	0.0227	4.0000e-005	3.9800e-003	4.0000e-005	4.0100e-003	1.0600e-003	3.0000e-005	1.0900e-003	0.0000	3.9201	3.9201	2.0000e-004	0.0000	3.9252
Total	**3.9900e-003**	**0.0449**	**0.0303**	**1.4000e-004**	**6.1000e-003**	**2.9000e-004**	**6.3900e-003**	**1.6400e-003**	**2.7000e-004**	**1.9200e-003**	**0.0000**	**13.7737**	**13.7737**	**6.2000e-004**	**0.0000**	**13.7892**

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					0.0117	0.0000	0.0117	1.2600e-003	0.0000	1.2600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0171	0.3218	0.3791	7.1000e-004		0.0138	0.0138		0.0138	0.0138	0.0000	59.1739	59.1739	0.0183	0.0000	59.6322

Total	**0.0171**	**0.3218**	**0.3791**	**7.1000e-004**	**0.0117**	**0.0138**	**0.0255**	**1.2600e-003**	**0.0138**	**0.0150**	**0.0000**	**59.1739**	**59.1739**	**0.0183**	**0.0000**	**59.6322**

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	1.3200e-003	0.0424	7.5700e-003	1.0000e-004	2.1200e-003	2.5000e-004	2.3800e-003	5.8000e-004	2.4000e-004	8.3000e-004	0.0000	9.8535	9.8535	4.2000e-004	0.0000	9.8640
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	2.6700e-003	2.5600e-003	0.0227	4.0000e-005	3.9800e-003	4.0000e-005	4.0100e-003	1.0600e-003	3.0000e-005	1.0900e-003	0.0000	3.9201	3.9201	2.0000e-004	0.0000	3.9252
Total	**3.9900e-003**	**0.0449**	**0.0303**	**1.4000e-004**	**6.1000e-003**	**2.9000e-004**	**6.3900e-003**	**1.6400e-003**	**2.7000e-004**	**1.9200e-003**	**0.0000**	**13.7737**	**13.7737**	**6.2000e-004**	**0.0000**	**13.7892**

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	0.0204	0.2157	0.1602	2.8000e-004		0.0111	0.0111		0.0105	0.0105	0.0000	24.7167	24.7167	6.1900e-003	0.0000	24.8715
Total	**0.0204**	**0.2157**	**0.1602**	**2.8000e-004**		**0.0111**	**0.0111**		**0.0105**	**0.0105**	**0.0000**	**24.7167**	**24.7167**	**6.1900e-003**	**0.0000**	**24.8715**

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	2.0900e-003	0.0471	0.0135	9.0000e-005	2.1400e-003	4.4000e-004	2.5700e-003	6.2000e-004	4.2000e-004	1.0400e-003	0.0000	8.9311	8.9311	5.4000e-004	0.0000	8.9446
Worker	0.0108	0.0103	0.0915	1.8000e-004	0.0160	1.5000e-004	0.0162	4.2600e-003	1.4000e-004	4.4000e-003	0.0000	15.8060	15.8060	8.2000e-004	0.0000	15.8264
Total	**0.0129**	**0.0574**	**0.1050**	**2.7000e-004**	**0.0182**	**5.9000e-004**	**0.0188**	**4.8800e-003**	**5.6000e-004**	**5.4400e-003**	**0.0000**	**24.7371**	**24.7371**	**1.3600e-003**	**0.0000**	**24.7710**

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	4.7400e-003	0.0974	0.1500	2.8000e-004		3.9500e-003	3.9500e-003		3.9500e-003	3.9500e-003	0.0000	20.6472	20.6472	5.9000e-003	0.0000	20.7946
Total	**4.7400e-003**	**0.0974**	**0.1500**	**2.8000e-004**		**3.9500e-003**	**3.9500e-003**		**3.9500e-003**	**3.9500e-003**	**0.0000**	**20.6472**	**20.6472**	**5.9000e-003**	**0.0000**	**20.7946**

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	2.0900e-003	0.0471	0.0135	9.0000e-005	2.1400e-003	4.4000e-004	2.5700e-003	6.2000e-004	4.2000e-004	1.0400e-003	0.0000	8.9311	8.9311	5.4000e-004	0.0000	8.9446
Worker	0.0108	0.0103	0.0915	1.8000e-004	0.0160	1.5000e-004	0.0162	4.2600e-003	1.4000e-004	4.4000e-003	0.0000	15.8060	15.8060	8.2000e-004	0.0000	15.8264
Total	**0.0129**	**0.0574**	**0.1050**	**2.7000e-004**	**0.0182**	**5.9000e-004**	**0.0188**	**4.8800e-003**	**5.6000e-004**	**5.4400e-003**	**0.0000**	**24.7371**	**24.7371**	**1.3600e-003**	**0.0000**	**24.7710**

3.4 Building Construction - 2019

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	0.0986	1.0530	0.8431	1.4800e-003		0.0520	0.0520		0.0491	0.0491	0.0000	131.6164	131.6164	0.0330	0.0000	132.4421
Total	**0.0986**	**1.0530**	**0.8431**	**1.4800e-003**		**0.0520**	**0.0520**		**0.0491**	**0.0491**	**0.0000**	**131.6164**	**131.6164**	**0.0330**	**0.0000**	**132.4421**

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	9.7900e-003	0.2392	0.0643	5.0000e-004	0.0115	1.9100e-003	0.0134	3.3300e-003	1.8300e-003	5.1500e-003	0.0000	47.9132	47.9132	2.7800e-003	0.0000	47.9827
Worker	0.0520	0.0488	0.4349	9.2000e-004	0.0864	7.7000e-004	0.0872	0.0230	7.1000e-004	0.0237	0.0000	82.7529	82.7529	3.8600e-003	0.0000	82.8494
Total	**0.0618**	**0.2880**	**0.4992**	**1.4200e-003**	**0.0979**	**2.6800e-003**	**0.1006**	**0.0263**	**2.5400e-003**	**0.0288**	**0.0000**	**130.6661**	**130.6661**	**6.6400e-003**	**0.0000**	**130.8321**

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	0.0256	0.5248	0.8081	1.4800e-003		0.0213	0.0213		0.0213	0.0213	0.0000	109.6862	109.6862	0.0316	0.0000	110.4772
Total	**0.0256**	**0.5248**	**0.8081**	**1.4800e-003**		**0.0213**	**0.0213**		**0.0213**	**0.0213**	**0.0000**	**109.6862**	**109.6862**	**0.0316**	**0.0000**	**110.4772**

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	9.7900e-003	0.2392	0.0643	5.0000e-004	0.0115	1.9100e-003	0.0134	3.3300e-003	1.8300e-003	5.1500e-003	0.0000	47.9132	47.9132	2.7800e-003	0.0000	47.9827
Worker	0.0520	0.0488	0.4349	9.2000e-004	0.0864	7.7000e-004	0.0872	0.0230	7.1000e-004	0.0237	0.0000	82.7529	82.7529	3.8600e-003	0.0000	82.8494
Total	**0.0618**	**0.2880**	**0.4992**	**1.4200e-003**	**0.0979**	**2.6800e-003**	**0.1006**	**0.0263**	**2.5400e-003**	**0.0288**	**0.0000**	**130.6661**	**130.6661**	**6.6400e-003**	**0.0000**	**130.8321**

3.5 Paving - 2019

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	0.0136	0.1300	0.1217	1.9000e-004		7.7300e-003	7.7300e-003		7.1500e-003	7.1500e-003	0.0000	16.0354	16.0354	4.7500e-003	0.0000	16.1541
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0136**	**0.1300**	**0.1217**	**1.9000e-004**		**7.7300e-003**	**7.7300e-003**		**7.1500e-003**	**7.1500e-003**	**0.0000**	**16.0354**	**16.0354**	**4.7500e-003**	**0.0000**	**16.1541**

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	1.1000e-003	1.0300e-003	9.2100e-003	2.0000e-005	1.8300e-003	2.0000e-005	1.8500e-003	4.9000e-004	2.0000e-005	5.0000e-004	0.0000	1.7520	1.7520	8.0000e-005	0.0000	1.7540
Total	**1.1000e-003**	**1.0300e-003**	**9.2100e-003**	**2.0000e-005**	**1.8300e-003**	**2.0000e-005**	**1.8500e-003**	**4.9000e-004**	**2.0000e-005**	**5.0000e-004**	**0.0000**	**1.7520**	**1.7520**	**8.0000e-005**	**0.0000**	**1.7540**

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	6.4200e-003	0.0968	0.1265	1.9000e-004		5.9000e-003	5.9000e-003		5.7700e-003	5.7700e-003	0.0000	15.4091	15.4091	4.6800e-003	0.0000	15.5262
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	6.4200e-003	0.0968	0.1265	1.9000e-004		5.9000e-003	5.9000e-003		5.7700e-003	5.7700e-003	0.0000	15.4091	15.4091	4.6800e-003	0.0000	15.5262

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	1.1000e-003	1.0300e-003	9.2100e-003	2.0000e-005	1.8300e-003	2.0000e-005	1.8500e-003	4.9000e-004	2.0000e-005	5.0000e-004	0.0000	1.7520	1.7520	8.0000e-005	0.0000	1.7540
Total	**1.1000e-003**	**1.0300e-003**	**9.2100e-003**	**2.0000e-005**	**1.8300e-003**	**2.0000e-005**	**1.8500e-003**	**4.9000e-004**	**2.0000e-005**	**5.0000e-004**	**0.0000**	**1.7520**	**1.7520**	**8.0000e-005**	**0.0000**	**1.7540**

3.6 Architectural Coating - 2019

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	0.9167					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.0000e-005	1.0200e-003	1.6400e-003	0.0000		3.0000e-005	3.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.2262	0.2262	7.0000e-005	0.0000	0.2280
Total	**0.9168**	**1.0200e-003**	**1.6400e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.2262**	**0.2262**	**7.0000e-005**	**0.0000**	**0.2280**

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	1.0500e-003	9.9000e-004	8.8100e-003	2.0000e-005	1.7500e-003	2.0000e-005	1.7700e-003	4.7000e-004	1.0000e-005	4.8000e-004	0.0000	1.6758	1.6758	8.0000e-005	0.0000	1.6777
Total	**1.0500e-003**	**9.9000e-004**	**8.8100e-003**	**2.0000e-005**	**1.7500e-003**	**2.0000e-005**	**1.7700e-003**	**4.7000e-004**	**1.0000e-005**	**4.8000e-004**	**0.0000**	**1.6758**	**1.6758**	**8.0000e-005**	**0.0000**	**1.6777**

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	0.9167					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.0000e-005	1.4200e-003	1.9100e-003	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.2262	0.2262	7.0000e-005	0.0000	0.2280

Total	**0.9168**	**1.4200e-003**	**1.9100e-003**	**0.0000**		**6.0000e-005**	**6.0000e-005**		**6.0000e-005**	**6.0000e-005**	**0.0000**	**0.2262**	**0.2262**	**7.0000e-005**	**0.0000**	**0.2280**

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	1.0500e-003	9.9000e-004	8.8100e-003	2.0000e-005	1.7500e-003	2.0000e-005	1.7700e-003	4.7000e-004	1.0000e-005	4.8000e-004	0.0000	1.6758	1.6758	8.0000e-005	0.0000	1.6777
Total	**1.0500e-003**	**9.9000e-004**	**8.8100e-003**	**2.0000e-005**	**1.7500e-003**	**2.0000e-005**	**1.7700e-003**	**4.7000e-004**	**1.0000e-005**	**4.8000e-004**	**0.0000**	**1.6758**	**1.6758**	**8.0000e-005**	**0.0000**	**1.6777**

UCSC Student Housing

Monterey Bay Unified APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	30.00	Space	0.00	12,000.00	0
Apartments Mid Rise	148.00	Dwelling Unit	3.89	146,100.00	423

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.8	**Precipitation Freq (Days)**	53
Climate Zone	5			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 Emission Rate

Land Use - From project description, added community center sf to residential. Estiamted arcreage as this does not include childcare

Construction Phase - Adjusted schedule to project

Off-road Equipment - Based on provided list

Off-road Equipment - Based on provided list

Off-road Equipment - Based on provided list

Off-road Equipment - Based on provided list

Off-road Equipment - Based on provided list

Demolition -

Grading - Assumed balance but included 1,000cy import/export

Construction Off-road Equipment Mitigation - Tier 3 Mobile/Tier 4 Portable/BMPs for fugitive dust

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	5.00	10.00
tblConstructionPhase	NumDays	8.00	20.00
tblConstructionPhase	NumDays	18.00	20.00
tblConstructionPhase	NumDays	18.00	20.00
tblLandUse	LandUseSquareFeet	148,000.00	146,100.00
tblLandUse	LotAcreage	0.27	0.00
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	7.00	3.20
tblOffRoadEquipment	UsageHours	8.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	6.00	5.60
tblOffRoadEquipment	UsageHours	6.00	5.60
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblTripsAndVMT	HaulingTripNumber	0.00	250.00
tblTripsAndVMT	WorkerTripNumber	30.00	23.00

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	5.6039	65.4181	38.8088	0.0856	3.2274	2.6149	5.8423	0.4494	2.4240	2.8734	0.0000	8,581.1171	8,581.1171	2.1269	0.0000	8,634.2904
2019	91.7809	13.7299	13.9933	0.0306	1.0419	0.7743	1.6052	0.2791	0.7162	0.8108	0.0000	3,043.1979	3,043.1979	0.5328	0.0000	3,054.4820
Maximum	**91.7809**	**65.4181**	**38.8088**	**0.0856**	**3.2274**	**2.6149**	**5.8423**	**0.4494**	**2.4240**	**2.8734**	**0.0000**	**8,581.1171**	**8,581.1171**	**2.1269**	**0.0000**	**8,634.2904**

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	2.1110	36.5590	40.9924	0.0856	1.7984	1.4108	3.2092	0.2951	1.4026	1.6977	0.0000	8,075.9539	8,075.9539	2.0883	0.0000	8,128.1614
2019	91.7809	9.7712	13.6319	0.0306	1.0419	0.5914	1.2890	0.2791	0.5788	0.6289	0.0000	2,793.9841	2,793.9841	0.5256	0.0000	2,804.8735
Maximum	**91.7809**	**36.5590**	**40.9924**	**0.0856**	**1.7984**	**1.4108**	**3.2092**	**0.2951**	**1.4026**	**1.6977**	**0.0000**	**8,075.9539**	**8,075.9539**	**2.0883**	**0.0000**	**8,128.1614**

	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	N20	CO2e
Percent Reduction	**3.59**	**41.46**	**-3.45**	**0.00**	**33.47**	**40.92**	**39.60**	**21.18**	**36.90**	**36.85**	**0.00**	**6.49**	**6.49**	**1.72**	**0.00**	**6.47**

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	10/1/2018	10/12/2018	5	10	2 weeks
2	Grading	Grading	10/13/2018	11/9/2018	5	20	8 weeks
3	Building Construction	Building Construction	11/10/2018	9/27/2019	5	230	44 weeks - overlap
4	Paving	Paving	9/28/2019	10/25/2019	5	20	1 week - overlap
5	Architectural Coating	Architectural Coating	10/26/2019	11/22/2019	5	20	36 weeks - overlap

Acres of Grading (Site Preparation Phase): 10.5

Acres of Grading (Grading Phase): 49

Acres of Paving: 0

Residential Indoor: 295,853; Residential Outdoor: 98,618; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Crawler Tractors	1	5.60	212	0.43
Site Preparation	Excavators	1	5.60	158	0.38
Site Preparation	Generator Sets	1	5.60	84	0.74
Site Preparation	Off-Highway Tractors	1	5.60	124	0.44
Site Preparation	Rubber Tired Dozers	0	5.60	247	0.40
Site Preparation	Scrapers	1	5.60	367	0.48
Site Preparation	Signal Boards	2	5.60	6	0.82
Site Preparation	Skid Steer Loaders	1	5.60	65	0.37
Site Preparation	Sweepers/Scrubbers	1	2.00	64	0.46
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Grading	Crawler Tractors	1	5.60	212	0.43
Grading	Excavators	2	5.60	158	0.38
Grading	Generator Sets	1	5.60	84	0.74
Grading	Graders	2	5.60	187	0.41
Grading	Off-Highway Tractors	2	5.60	124	0.44
Grading	Plate Compactors	2	5.60	8	0.43
Grading	Rollers	2	5.60	80	0.38
Grading	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Rubber Tired Loaders	2	5.60	203	0.36
Grading	Scrapers	2	5.60	367	0.48
Grading	Signal Boards	2	5.60	6	0.82
Grading	Skid Steer Loaders	1	5.60	65	0.37
Grading	Sweepers/Scrubbers	1	2.00	64	0.46
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Aerial Lifts	4	3.20	63	0.31
Building Construction	Air Compressors	1	3.20	78	0.48
Building Construction	Cranes	2	3.20	231	0.29
Building Construction	Forklifts	0	8.00	89	0.20

Building Construction	Generator Sets	1	3.20	84	0.74
Building Construction	Rough Terrain Forklifts	2	3.20	100	0.40
Building Construction	Sweepers/Scrubbers	1	3.20	64	0.46
Building Construction	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	1.20	63	0.31
Architectural Coating	Air Compressors	0	6.00	78	0.48
Paving	Pavers	1	5.60	130	0.42
Paving	Paving Equipment	1	5.60	132	0.36
Paving	Plate Compactors	1	5.60	8	0.43
Paving	Rollers	2	5.60	80	0.38
Paving	Signal Boards	2	5.60	6	0.82
Paving	Skid Steer Loaders	1	5.60	65	0.37
Paving	Sweepers/Scrubbers	1	5.60	64	0.46
Site Preparation	Rubber Tired Loaders	1	5.60	203	0.36
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

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
Site Preparation	10	25.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	20	50.00	0.00	250.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	11	112.00	18.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	12	23.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	22.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved 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					1.1135	0.0000	1.1135	0.1202	0.0000	0.1202			0.0000			0.0000
Off-Road	2.5425	29.0362	18.2107	0.0350		1.2666	1.2666		1.1815	1.1815		3,470.1137	3,470.1137	0.9617		3,494.1552
Total	**2.5425**	**29.0362**	**18.2107**	**0.0350**	**1.1135**	**1.2666**	**2.3802**	**0.1202**	**1.1815**	**1.3018**		**3,470.1137**	**3,470.1137**	**0.9617**		**3,494.1552**

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	0.1340	0.1120	1.1806	2.3000e-003	0.2054	1.8500e-003	0.2072	0.0545	1.7100e-003	0.0562		228.7918	228.7918	0.0116		229.0823
Total	**0.1340**	**0.1120**	**1.1806**	**2.3000e-003**	**0.2054**	**1.8500e-003**	**0.2072**	**0.0545**	**1.7100e-003**	**0.0562**		**228.7918**	**228.7918**	**0.0116**		**229.0823**

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					0.5011	0.0000	0.5011	0.0541	0.0000	0.0541			0.0000			0.0000
Off-Road	0.7908	14.7572	17.3559	0.0350		0.6262	0.6262		0.6228	0.6228	0.0000	2,964.950 5	2,964.9505	0.9230		2,988.026 2
Total	**0.7908**	**14.7572**	**17.3559**	**0.0350**	**0.5011**	**0.6262**	**1.1273**	**0.0541**	**0.6228**	**0.6769**	**0.0000**	**2,964.950 5**	**2,964.9505**	**0.9230**		**2,988.026 2**

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	0.1340	0.1120	1.1806	2.3000e-003	0.2054	1.8500e-003	0.2072	0.0545	1.7100e-003	0.0562		228.7918	228.7918	0.0116		229.0823
Total	**0.1340**	**0.1120**	**1.1806**	**2.3000e-003**	**0.2054**	**1.8500e-003**	**0.2072**	**0.0545**	**1.7100e-003**	**0.0562**		**228.7918**	**228.7918**	**0.0116**		**229.0823**

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					2.5982	0.0000	2.5982	0.2806	0.0000	0.2806			0.0000			0.0000
Off-Road	5.2055	61.0420	35.7224	0.0706		2.5862	2.5862		2.3967	2.3967		7,027.9799	7,027.9799	2.0593		7,079.4613
Total	**5.2055**	**61.0420**	**35.7224**	**0.0706**	**2.5982**	**2.5862**	**5.1845**	**0.2806**	**2.3967**	**2.6772**		**7,027.9799**	**7,027.9799**	**2.0593**		**7,079.4613**

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	0.1305	4.1522	0.7251	0.0104	0.2184	0.0250	0.2434	0.0599	0.0239	0.0838		1,095.5537	1,095.5537	0.0444		1,096.6644
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	0.2679	0.2240	2.3612	4.6100e-003	0.4107	3.6900e-003	0.4144	0.1090	3.4100e-003	0.1124		457.5836	457.5836	0.0233		458.1647
Total	**0.3984**	**4.3762**	**3.0864**	**0.0150**	**0.6292**	**0.0287**	**0.6579**	**0.1688**	**0.0273**	**0.1961**		**1,553.1372**	**1,553.1372**	**0.0677**		**1,554.8291**

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					1.1692	0.0000	1.1692	0.1263	0.0000	0.1263			0.0000			0.0000
Off-Road	1.7125	32.1829	37.9061	0.0706		1.3822	1.3822		1.3753	1.3753	0.0000	6,522.8167	6,522.8167	2.0206		6,573.3323
Total	**1.7125**	**32.1829**	**37.9061**	**0.0706**	**1.1692**	**1.3822**	**2.5514**	**0.1263**	**1.3753**	**1.5015**	**0.0000**	**6,522.8167**	**6,522.8167**	**2.0206**		**6,573.3323**

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	0.1305	4.1522	0.7251	0.0104	0.2184	0.0250	0.2434	0.0599	0.0239	0.0838		1,095.5537	1,095.5537	0.0444		1,096.6644
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	0.2679	0.2240	2.3612	4.6100e-003	0.4107	3.6900e-003	0.4144	0.1090	3.4100e-003	0.1124		457.5836	457.5836	0.0233		458.1647
Total	**0.3984**	**4.3762**	**3.0864**	**0.0150**	**0.6292**	**0.0287**	**0.6579**	**0.1688**	**0.0273**	**0.1961**		**1,553.1372**	**1,553.1372**	**0.0677**		**1,554.8291**

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	1.1351	11.9814	8.9022	0.0153		0.6184	0.6184		0.5838	0.5838		1,513.6395	1,513.6395	0.3792		1,523.1182
Total	**1.1351**	**11.9814**	**8.9022**	**0.0153**		**0.6184**	**0.6184**		**0.5838**	**0.5838**		**1,513.6395**	**1,513.6395**	**0.3792**		**1,523.1182**

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	0.1138	2.5793	0.7042	5.2800e-003	0.1219	0.0241	0.1459	0.0351	0.0230	0.0581		553.8873	553.8873	0.0317		554.6799
Worker	0.6002	0.5017	5.2892	0.0103	0.9201	8.2700e-003	0.9283	0.2440	7.6400e-003	0.2517		1,024.9872	1,024.9872	0.0521		1,026.2889
Total	**0.7140**	**3.0810**	**5.9933**	**0.0156**	**1.0419**	**0.0324**	**1.0743**	**0.2791**	**0.0307**	**0.3098**		**1,578.8745**	**1,578.8745**	**0.0838**		**1,580.9688**

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	0.2635	5.4101	8.3306	0.0153		0.2196	0.2196		0.2196	0.2196	0.0000	1,264.4257	1,264.4257	0.3612		1,273.4549
Total	**0.2635**	**5.4101**	**8.3306**	**0.0153**		**0.2196**	**0.2196**		**0.2196**	**0.2196**	**0.0000**	**1,264.4257**	**1,264.4257**	**0.3612**		**1,273.4549**

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	0.1138	2.5793	0.7042	5.2800e-003	0.1219	0.0241	0.1459	0.0351	0.0230	0.0581		553.8873	553.8873	0.0317		554.6799
Worker	0.6002	0.5017	5.2892	0.0103	0.9201	8.2700e-003	0.9283	0.2440	7.6400e-003	0.2517		1,024.9872	1,024.9872	0.0521		1,026.2889

Total	**0.7140**	**3.0810**	**5.9933**	**0.0156**	**1.0419**	**0.0324**	**1.0743**	**0.2791**	**0.0307**	**0.3098**		**1,578.8745**	**1,578.8745**	**0.0838**		**1,580.9688**

3.4 Building Construction - 2019

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	1.0162	10.8561	8.6920	0.0153		0.5358	0.5358		0.5057	0.5057		1,495.6929	1,495.6929	0.3754		1,505.0766
Total	**1.0162**	**10.8561**	**8.6920**	**0.0153**		**0.5358**	**0.5358**		**0.5057**	**0.5057**		**1,495.6929**	**1,495.6929**	**0.3754**		**1,505.0766**

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	0.0988	2.4334	0.6206	5.2600e-003	0.1219	0.0195	0.1414	0.0351	0.0187	0.0537		551.5642	551.5642	0.0302		552.3195
Worker	0.5386	0.4403	4.6807	0.0100	0.9201	7.9500e-003	0.9280	0.2440	7.3400e-003	0.2514		995.9408	995.9408	0.0458		997.0860
Total	**0.6375**	**2.8737**	**5.3013**	**0.0153**	**1.0419**	**0.0275**	**1.0694**	**0.2791**	**0.0260**	**0.3051**		**1,547.5050**	**1,547.5050**	**0.0760**		**1,549.4054**

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	0.2635	5.4101	8.3306	0.0153		0.2196	0.2196		0.2196	0.2196	0.0000	1,246.4791	1,246.4791	0.3596		1,255.4681
Total	**0.2635**	**5.4101**	**8.3306**	**0.0153**		**0.2196**	**0.2196**		**0.2196**	**0.2196**	**0.0000**	**1,246.4791**	**1,246.4791**	**0.3596**		**1,255.4681**

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	0.0988	2.4334	0.6206	5.2600e-003	0.1219	0.0195	0.1414	0.0351	0.0187	0.0537		551.5642	551.5642	0.0302		552.3195
Worker	0.5386	0.4403	4.6807	0.0100	0.9201	7.9500e-003	0.9280	0.2440	7.3400e-003	0.2514		995.9408	995.9408	0.0458		997.0860
Total	**0.6375**	**2.8737**	**5.3013**	**0.0153**	**1.0419**	**0.0275**	**1.0694**	**0.2791**	**0.0260**	**0.3051**		**1,547.5050**	**1,547.5050**	**0.0760**		**1,549.4054**

3.5 Paving - 2019

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	1.3559	12.9960	12.1729	0.0185		0.7727	0.7727		0.7147	0.7147		1,767.6021	1,767.6021	0.5233		1,780.6856
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3559**	**12.9960**	**12.1729**	**0.0185**		**0.7727**	**0.7727**		**0.7147**	**0.7147**		**1,767.6021**	**1,767.6021**	**0.5233**		**1,780.6856**

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	0.1106	0.0904	0.9612	2.0600e-003	0.1889	1.6300e-003	0.1906	0.0501	1.5100e-003	0.0516		204.5236	204.5236	9.4100e-003		204.7587
Total	**0.1106**	**0.0904**	**0.9612**	**2.0600e-003**	**0.1889**	**1.6300e-003**	**0.1906**	**0.0501**	**1.5100e-003**	**0.0516**		**204.5236**	**204.5236**	**9.4100e-003**		**204.7587**

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	0.6416	9.6808	12.6508	0.0185		0.5898	0.5898		0.5773	0.5773	0.0000	1,698.5632	1,698.5632	0.5162		1,711.4674
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6416**	**9.6808**	**12.6508**	**0.0185**		**0.5898**	**0.5898**		**0.5773**	**0.5773**	**0.0000**	**1,698.5632**	**1,698.5632**	**0.5162**		**1,711.4674**

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	0.1106	0.0904	0.9612	2.0600e-003	0.1889	1.6300e-003	0.1906	0.0501	1.5100e-003	0.0516		204.5236	204.5236	9.4100e-003		204.7587
Total	**0.1106**	**0.0904**	**0.9612**	**2.0600e-003**	**0.1889**	**1.6300e-003**	**0.1906**	**0.0501**	**1.5100e-003**	**0.0516**		**204.5236**	**204.5236**	**9.4100e-003**		**204.7587**

3.6 Architectural Coating - 2019

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	91.6689					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	6.1100e-003	0.1021	0.1639	2.5000e-004		2.5100e-003	2.5100e-003		2.3100e-003	2.3100e-003		24.9350	24.9350	7.8900e-003		25.1323
Total	**91.6751**	**0.1021**	**0.1639**	**2.5000e-004**		**2.5100e-003**	**2.5100e-003**		**2.3100e-003**	**2.3100e-003**		**24.9350**	**24.9350**	**7.8900e-003**		**25.1323**

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	0.1058	0.0865	0.9194	1.9700e-003	0.1807	1.5600e-003	0.1823	0.0479	1.4400e-003	0.0494		195.6312	195.6312	9.0000e-003		195.8562
Total	**0.1058**	**0.0865**	**0.9194**	**1.9700e-003**	**0.1807**	**1.5600e-003**	**0.1823**	**0.0479**	**1.4400e-003**	**0.0494**		**195.6312**	**195.6312**	**9.0000e-003**		**195.8562**

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	91.6689					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	6.2000e-003	0.1416	0.1912	2.5000e-004		5.7900e-003	5.7900e-003		5.7900e-003	5.7900e-003	0.0000	24.9350	24.9350	7.8900e-003		25.1323
Total	**91.6751**	**0.1416**	**0.1912**	**2.5000e-004**		**5.7900e-003**	**5.7900e-003**		**5.7900e-003**	**5.7900e-003**	**0.0000**	**24.9350**	**24.9350**	**7.8900e-003**		**25.1323**

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	0.1058	0.0865	0.9194	1.9700e-003	0.1807	1.5600e-003	0.1823	0.0479	1.4400e-003	0.0494		195.6312	195.6312	9.0000e-003		195.8562

Total	**0.1058**	**0.0865**	**0.9194**	**1.9700e-003**	**0.1807**	**1.5600e-003**	**0.1823**	**0.0479**	**1.4400e-003**	**0.0494**		**195.6312**	**195.6312**	**9.0000e-003**		**195.8562**

UCSC Hagar Site Operation

Monterey Bay Unified APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	13.50	1000sqft	0.31	13,500.00	0
Apartments Mid Rise	148.00	Dwelling Unit	3.89	146,100.00	423
Parking Lot	30.00	Space	0.27	12,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.8	**Precipitation Freq (Days)**	53
Climate Zone	5			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 rate

Land Use - from project description

Construction Phase - Operational Run only

Off-road Equipment - Operatonal run only

Grading -

Trips and VMT - operational run only

Energy Use -

Water And Wastewater - from project description. all wastewater treatment

Solid Waste - based on project description

Energy Mitigation - new energy-efficient construciton

Water Mitigation - low-flow fixtures and water-efficient irrigation

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	5.00	0.00
tblConstructionPhase	PhaseEndDate	1/24/2019	1/17/2019
tblLandUse	LandUseSquareFeet	148,000.00	146,100.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblSolidWaste	SolidWasteGenerationRate	68.08	162.50
tblSolidWaste	SolidWasteGenerationRate	17.55	0.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	9,642,795.79	7,200,000.00
tblWater	IndoorWaterUseRate	579,009.16	0.00
tblWater	OutdoorWaterUseRate	6,079,153.87	3,496,267.00
tblWater	OutdoorWaterUseRate	1,488,880.70	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	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					
Area	0.7718	0.0177	1.5319	8.0000e-005		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003	0.0000	2.4942	2.4942	2.4300e-003	0.0000	2.5551
Energy	8.1700e-003	0.0704	0.0345	4.5000e-004		5.6400e-003	5.6400e-003		5.6400e-003	5.6400e-003	0.0000	171.4483	171.4483	0.0106	3.3600e-003	172.7139
Mobile	0.7095	3.4990	7.7189	0.0194	1.3685	0.0240	1.3925	0.3676	0.0226	0.3903	0.0000	1,779.9640	1,779.9640	0.1064	0.0000	1,782.6241
Waste						0.0000	0.0000		0.0000	0.0000	32.9860	0.0000	32.9860	1.9494	0.0000	81.7215
Water						0.0000	0.0000		0.0000	0.0000	2.5474	6.7344	9.2818	9.4400e-003	5.6800e-003	11.2102
Total	**1.4895**	**3.5872**	**9.2853**	**0.0199**	**1.3685**	**0.0381**	**1.4066**	**0.3676**	**0.0367**	**0.4043**	**35.5334**	**1,960.6410**	**1,996.1744**	**2.0783**	**9.0400e-003**	**2,050.8248**

Mitigated Operational

	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					
Area	0.7718	0.0177	1.5319	8.0000e-005		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003	0.0000	2.4942	2.4942	2.4300e-003	0.0000	2.5551
Energy	8.1700e-003	0.0704	0.0345	4.5000e-004		5.6400e-003	5.6400e-003		5.6400e-003	5.6400e-003	0.0000	163.9372	163.9372	9.8600e-003	3.2000e-003	165.1378
Mobile	0.7095	3.4990	7.7189	0.0194	1.3685	0.0240	1.3925	0.3676	0.0226	0.3903	0.0000	1,779.9640	1,779.9640	0.1064	0.0000	1,782.6241
Waste						0.0000	0.0000		0.0000	0.0000	32.9860	0.0000	32.9860	1.9494	0.0000	81.7215
Water						0.0000	0.0000		0.0000	0.0000	2.0379	5.6113	7.6492	7.5800e-003	4.5500e-003	9.1938
Total	**1.4895**	**3.5872**	**9.2853**	**0.0199**	**1.3685**	**0.0381**	**1.4066**	**0.3676**	**0.0367**	**0.4043**	**35.0239**	**1,952.0067**	**1,987.0307**	**2.0757**	**7.7500e-003**	**2,041.2322**

	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	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.43**	**0.44**	**0.46**	**0.13**	**14.27**	**0.47**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	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					
Mitigated	0.7095	3.4990	7.7189	0.0194	1.3685	0.0240	1.3925	0.3676	0.0226	0.3903	0.0000	1,779.9640	1,779.9640	0.1064	0.0000	1,782.6241
Unmitigated	0.7095	3.4990	7.7189	0.0194	1.3685	0.0240	1.3925	0.3676	0.0226	0.3903	0.0000	1,779.9640	1,779.9640	0.1064	0.0000	1,782.6241

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	984.20	945.72	867.28	2,771,415	2,771,415
Day-Care Center	999.81	83.84	78.71	868,348	868,348
Parking Lot	0.00	0.00	0.00		
Total	1,984.01	1,029.56	945.99	3,639,764	3,639,764

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	7.30	7.50	44.00	18.80	37.20	86	11	3
Day-Care Center	9.50	7.30	7.30	12.70	82.30	5.00	28	58	14

Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.533000	0.030830	0.199754	0.134871	0.025112	0.005817	0.017861	0.037451	0.003065	0.002809	0.007291	0.001110	0.001028
Day-Care Center	0.533000	0.030830	0.199754	0.134871	0.025112	0.005817	0.017861	0.037451	0.003065	0.002809	0.007291	0.001110	0.001028
Parking Lot	0.533000	0.030830	0.199754	0.134871	0.025112	0.005817	0.017861	0.037451	0.003065	0.002809	0.007291	0.001110	0.001028

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	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					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	83.1205	83.1205	8.3100e-003	1.7200e-003	83.8408
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	90.6316	90.6316	9.0600e-003	1.8800e-003	91.4169
NaturalGas Mitigated	8.1700e-003	0.0704	0.0345	4.5000e-004		5.6400e-003	5.6400e-003		5.6400e-003	5.6400e-003	0.0000	80.8168	80.8168	1.5500e-003	1.4800e-003	81.2970
NaturalGas Unmitigated	8.1700e-003	0.0704	0.0345	4.5000e-004		5.6400e-003	5.6400e-003		5.6400e-003	5.6400e-003	0.0000	80.8168	80.8168	1.5500e-003	1.4800e-003	81.2970

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	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
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	1.2921e+006	6.9700e-003	0.0595	0.0253	3.8000e-004		4.8100e-003	4.8100e-003		4.8100e-003	4.8100e-003	0.0000	68.9516	68.9516	1.3200e-003	1.2600e-003	69.3613
Day-Care Center	222345	1.2000e-003	0.0109	9.1600e-003	7.0000e-005		8.3000e-004	8.3000e-004		8.3000e-004	8.3000e-004	0.0000	11.8652	11.8652	2.3000e-004	2.2000e-004	11.9357
Parking Lot	0	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
Total		**8.1700e-003**	**0.0704**	**0.0345**	**4.5000e-004**		**5.6400e-003**	**5.6400e-003**		**5.6400e-003**	**5.6400e-003**	**0.0000**	**80.8168**	**80.8168**	**1.5500e-003**	**1.4800e-003**	**81.2970**

Mitigated

	NaturalGas Use	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
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	1.2921e+006	6.9700e-003	0.0595	0.0253	3.8000e-004		4.8100e-003	4.8100e-003		4.8100e-003	4.8100e-003	0.0000	68.9516	68.9516	1.3200e-003	1.2600e-003	69.3613
Day-Care Center	222345	1.2000e-003	0.0109	9.1600e-003	7.0000e-005		8.3000e-004	8.3000e-004		8.3000e-004	8.3000e-004	0.0000	11.8652	11.8652	2.3000e-004	2.2000e-004	11.9357
Parking Lot	0	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
Total		**8.1700e-003**	**0.0704**	**0.0345**	**4.5000e-004**		**5.6400e-003**	**5.6400e-003**		**5.6400e-003**	**5.6400e-003**	**0.0000**	**80.8168**	**80.8168**	**1.5500e-003**	**1.4800e-003**	**81.2970**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e

Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	624855	82.1945	8.2200e-003	1.7000e-003	82.9067
Day-Care Center	59940	7.8846	7.9000e-004	1.6000e-004	7.9529
Parking Lot	4200	0.5525	6.0000e-005	1.0000e-005	0.5573
Total		**90.6316**	**9.0700e-003**	**1.8700e-003**	**91.4169**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	578418	76.0861	7.6100e-003	1.5700e-003	76.7455
Day-Care Center	50452.2	6.6366	6.6000e-004	1.4000e-004	6.6941
Parking Lot	3024	0.3978	4.0000e-005	1.0000e-005	0.4012
Total		**83.1205**	**8.3100e-003**	**1.7200e-003**	**83.8408**

6.0 Area Detail

6.1 Mitigation Measures Area

	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					
Mitigated	0.7718	0.0177	1.5319	8.0000e-005		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003	0.0000	2.4942	2.4942	2.4300e-003	0.0000	2.5551
Unmitigated	0.7718	0.0177	1.5319	8.0000e-005		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003	0.0000	2.4942	2.4942	2.4300e-003	0.0000	2.5551

6.2 Area by SubCategory

Unmitigated

	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
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1011					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6241					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	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
Landscaping	0.0467	0.0177	1.5319	8.0000e-005		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003	0.0000	2.4942	2.4942	2.4300e-003	0.0000	2.5551
Total	**0.7718**	**0.0177**	**1.5319**	**8.0000e-005**		**8.4200e-003**	**8.4200e-003**		**8.4200e-003**	**8.4200e-003**	**0.0000**	**2.4942**	**2.4942**	**2.4300e-003**	**0.0000**	**2.5551**

Mitigated

	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
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1011					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6241					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Hearth	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
Landscaping	0.0467	0.0177	1.5319	8.0000e-005		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003	0.0000	2.4942	2.4942	2.4300e-003	0.0000	2.5551
Total	**0.7718**	**0.0177**	**1.5319**	**8.0000e-005**		**8.4200e-003**	**8.4200e-003**		**8.4200e-003**	**8.4200e-003**	**0.0000**	**2.4942**	**2.4942**	**2.4300e-003**	**0.0000**	**2.5551**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	7.6492	7.5800e-003	4.5500e-003	9.1938
Unmitigated	9.2818	9.4400e-003	5.6800e-003	11.2102

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e

Land Use	Mgal	MT/yr			
Apartments Mid Rise	7.2 / 3.49627	9.2818	9.4400e-003	5.6800e-003	11.2102
Day-Care Center	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**9.2818**	**9.4400e-003**	**5.6800e-003**	**11.2102**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	5.76 / 3.28299	7.6492	7.5800e-003	4.5500e-003	9.1938
Day-Care Center	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**7.6492**	**7.5800e-003**	**4.5500e-003**	**9.1938**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e

	MT/yr			
Mitigated	32.9860	1.9494	0.0000	81.7215
Unmitigated	32.9860	1.9494	0.0000	81.7215

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	162.5	32.9860	1.9494	0.0000	81.7215
Day-Care Center	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**32.9860**	**1.9494**	**0.0000**	**81.7215**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	162.5	32.9860	1.9494	0.0000	81.7215
Day-Care Center	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000

Total		32.9860	1.9494	0.0000	81.7215

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

UCSC Hagar Site Operation

Monterey Bay Unified APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	13.50	1000sqft	0.31	13,500.00	0
Apartments Mid Rise	148.00	Dwelling Unit	3.89	146,100.00	423
Parking Lot	30.00	Space	0.27	12,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.8	**Precipitation Freq (Days)**	53
Climate Zone	5			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 rate

Land Use - from project description

Construction Phase - Operational Run only

Off-road Equipment - Operatonal run only

Grading -

Trips and VMT - operational run only

Energy Use -

Water And Wastewater - from project description. all wastewater treatment

Solid Waste - based on project description

Energy Mitigation - new energy-efficient construciton

Water Mitigation - low-flow fixtures and water-efficient irrigation

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	5.00	0.00
tblConstructionPhase	PhaseEndDate	1/24/2019	1/17/2019
tblLandUse	LandUseSquareFeet	148,000.00	146,100.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblSolidWaste	SolidWasteGenerationRate	68.08	162.50
tblSolidWaste	SolidWasteGenerationRate	17.55	0.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	9,642,795.79	7,200,000.00
tblWater	IndoorWaterUseRate	579,009.16	0.00
tblWater	OutdoorWaterUseRate	6,079,153.87	3,496,267.00
tblWater	OutdoorWaterUseRate	1,488,880.70	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	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					
Area	4.3469	0.1417	12.2553	6.5000e-004		0.0674	0.0674		0.0674	0.0674	0.0000	21.9953	21.9953	0.0215	0.0000	22.5319
Energy	0.0448	0.3860	0.1890	2.4400e-003		0.0309	0.0309		0.0309	0.0309		488.1382	488.1382	9.3600e-003	8.9500e-003	491.0389
Mobile	4.7910	21.0423	47.2036	0.1237	8.5543	0.1457	8.7000	2.2919	0.1372	2.4291		12,501.2122	12,501.2122	0.7208		12,519.2314
Total	**9.1826**	**21.5700**	**59.6478**	**0.1268**	**8.5543**	**0.2440**	**8.7983**	**2.2919**	**0.2355**	**2.5274**	**0.0000**	**13,011.3457**	**13,011.3457**	**0.7516**	**8.9500e-003**	**13,032.8022**

Mitigated Operational

	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					
Area	4.3469	0.1417	12.2553	6.5000e-004		0.0674	0.0674		0.0674	0.0674	0.0000	21.9953	21.9953	0.0215	0.0000	22.5319
Energy	0.0448	0.3860	0.1890	2.4400e-003		0.0309	0.0309		0.0309	0.0309		488.1382	488.1382	9.3600e-003	8.9500e-003	491.0389
Mobile	4.7910	21.0423	47.2036	0.1237	8.5543	0.1457	8.7000	2.2919	0.1372	2.4291		12,501.2122	12,501.2122	0.7208		12,519.2314
Total	**9.1826**	**21.5700**	**59.6478**	**0.1268**	**8.5543**	**0.2440**	**8.7983**	**2.2919**	**0.2355**	**2.5274**	**0.0000**	**13,011.3457**	**13,011.3457**	**0.7516**	**8.9500e-003**	**13,032.8022**

	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**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	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					
Mitigated	4.7910	21.0423	47.2036	0.1237	8.5543	0.1457	8.7000	2.2919	0.1372	2.4291		12,501.2122	12,501.2122	0.7208		12,519.2314
Unmitigated	4.7910	21.0423	47.2036	0.1237	8.5543	0.1457	8.7000	2.2919	0.1372	2.4291		12,501.2122	12,501.2122	0.7208		12,519.2314

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	984.20	945.72	867.28	2,771,415	2,771,415
Day-Care Center	999.81	83.84	78.71	868,348	868,348
Parking Lot	0.00	0.00	0.00		
Total	1,984.01	1,029.56	945.99	3,639,764	3,639,764

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	7.30	7.50	44.00	18.80	37.20	86	11	3
Day-Care Center	9.50	7.30	7.30	12.70	82.30	5.00	28	58	14
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.533000	0.030830	0.199754	0.134871	0.025112	0.005817	0.017861	0.037451	0.003065	0.002809	0.007291	0.001110	0.001028
Day-Care Center	0.533000	0.030830	0.199754	0.134871	0.025112	0.005817	0.017861	0.037451	0.003065	0.002809	0.007291	0.001110	0.001028

Parking Lot	0.533000	0.030830	0.199754	0.134871	0.025112	0.005817	0.017861	0.037451	0.003065	0.002809	0.007291	0.001110	0.001028

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	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					
NaturalGas Mitigated	0.0448	0.3860	0.1890	2.4400e-003		0.0309	0.0309		0.0309	0.0309		488.1382	488.1382	9.3600e-003	8.9500e-003	491.0389
NaturalGas Unmitigated	0.0448	0.3860	0.1890	2.4400e-003		0.0309	0.0309		0.0309	0.0309		488.1382	488.1382	9.3600e-003	8.9500e-003	491.0389

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	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
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	3540.01	0.0382	0.3262	0.1388	2.0800e-003		0.0264	0.0264		0.0264	0.0264		416.4718	416.4718	7.9800e-003	7.6400e-003	418.9466
Day-Care Center	609.164	6.5700e-003	0.0597	0.0502	3.6000e-004		4.5400e-003	4.5400e-003		4.5400e-003	4.5400e-003		71.6664	71.6664	1.3700e-003	1.3100e-003	72.0923

Parking Lot	0	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
Total		**0.0448**	**0.3860**	**0.1890**	**2.4400e-003**		**0.0309**	**0.0309**		**0.0309**	**0.0309**		**488.1382**	**488.1382**	**9.3500e-003**	**8.9500e-003**	**491.0389**

Mitigated

	NaturalGas Use	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
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	3.54001	0.0382	0.3262	0.1388	2.0800e-003		0.0264	0.0264		0.0264	0.0264		416.4718	416.4718	7.9800e-003	7.6400e-003	418.9466
Day-Care Center	0.609164	6.5700e-003	0.0597	0.0502	3.6000e-004		4.5400e-003	4.5400e-003		4.5400e-003	4.5400e-003		71.6664	71.6664	1.3700e-003	1.3100e-003	72.0923
Parking Lot	0	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
Total		**0.0448**	**0.3860**	**0.1890**	**2.4400e-003**		**0.0309**	**0.0309**		**0.0309**	**0.0309**		**488.1382**	**488.1382**	**9.3500e-003**	**8.9500e-003**	**491.0389**

6.0 Area Detail

6.1 Mitigation Measures Area

	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					
Mitigated	4.3469	0.1417	12.2553	6.5000e-004		0.0674	0.0674		0.0674	0.0674	0.0000	21.9953	21.9953	0.0215	0.0000	22.5319
Unmitigated	4.3469	0.1417	12.2553	6.5000e-004		0.0674	0.0674		0.0674	0.0674	0.0000	21.9953	21.9953	0.0215	0.0000	22.5319

6.2 Area by SubCategory

Unmitigated

	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
SubCategory	lb/day										lb/day					
Architectural Coating	0.5537					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.4197					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	0.3735	0.1417	12.2553	6.5000e-004		0.0674	0.0674		0.0674	0.0674		21.9953	21.9953	0.0215		22.5319
Total	**4.3469**	**0.1417**	**12.2553**	**6.5000e-004**		**0.0674**	**0.0674**		**0.0674**	**0.0674**	**0.0000**	**21.9953**	**21.9953**	**0.0215**	**0.0000**	**22.5319**

Mitigated

	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
SubCategory	lb/day										lb/day					
Architectural Coating	0.5537					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.4197					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	0.3735	0.1417	12.2553	6.5000e-004		0.0674	0.0674		0.0674	0.0674		21.9953	21.9953	0.0215		22.5319
Total	**4.3469**	**0.1417**	**12.2553**	**6.5000e-004**		**0.0674**	**0.0674**		**0.0674**	**0.0674**	**0.0000**	**21.9953**	**21.9953**	**0.0215**	**0.0000**	**22.5319**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

UCSC Student Housing Heller Site

Monterey Bay Unified APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	3.50	1000sqft	0.00	3,500.00	0
Parking Lot	414.00	Space	0.00	165,600.00	0
Apartments Low Rise	146.00	Dwelling Unit	9.13	67,932.00	418
Apartments Mid Rise	725.00	Dwelling Unit	19.08	900,779.00	2074

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.8	**Precipitation Freq (Days)**	53
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Using PG&E 2020 rate

Land Use - Based on project description. Wastewater added as Industrial use. Sf total = 968,711

Construction Phase - Based on durations provided and construction schedule

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on provided list

Trips and VMT -

Grading - Set to default acreage and used max.import/export quantities

Energy Use -

Water And Wastewater - Wastewater treatment, no septic or lagoons. 31,200,000 gallons potable water (2,187,938/29,012,062)

Solid Waste - Solidwate projection similar to project description

Construction Off-road Equipment Mitigation - Tier 4i portable/Tier 3 mobile and BMPs for fugitive dust

Mobile Land Use Mitigation -

Energy Mitigation -

Water Mitigation -

Demolition -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	20.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	14.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	35.00	15.00
tblConstructionPhase	NumDays	35.00	250.00
tblConstructionPhase	PhaseEndDate	8/28/2019	11/28/2019
tblConstructionPhase	PhaseEndDate	10/30/2019	1/30/2020
tblConstructionPhase	PhaseEndDate	7/7/2021	10/7/2021
tblConstructionPhase	PhaseEndDate	8/25/2021	2/28/2022
tblConstructionPhase	PhaseEndDate	10/13/2021	6/15/2022
tblConstructionPhase	PhaseStartDate	8/1/2019	11/1/2019
tblConstructionPhase	PhaseStartDate	8/29/2019	11/29/2019
tblConstructionPhase	PhaseStartDate	10/31/2019	1/31/2020
tblConstructionPhase	PhaseStartDate	7/8/2021	2/8/2022
tblConstructionPhase	PhaseStartDate	8/26/2021	7/1/2021
tblGrading	MaterialImported	0.00	40,000.00
tblLandUse	LandUseSquareFeet	146,000.00	67,932.00
tblLandUse	LandUseSquareFeet	725,000.00	900,779.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	3.73	0.00
tblOffRoadEquipment	HorsePower	203.00	247.00
tblOffRoadEquipment	LoadFactor	0.36	0.40
tblOffRoadEquipment	LoadFactor	0.41	0.41
tblOffRoadEquipment	LoadFactor	0.41	0.41
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	1.20
tblOffRoadEquipment	UsageHours	7.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	3.20
tblOffRoadEquipment	UsageHours	8.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00

tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	9,512,487.74	2,187,938.00
tblWater	IndoorWaterUseRate	47,236,668.58	29,012,062.00
tblWater	OutdoorWaterUseRate	5,997,003.14	0.00
tblWater	OutdoorWaterUseRate	29,779,638.88	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	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					
2019	0.1994	2.4239	1.2949	3.7400e-003	0.2778	0.0863	0.3642	0.0808	0.0804	0.1612	0.0000	338.8459	338.8459	0.0698	0.0000	340.5900
2020	1.1745	9.6353	9.8653	0.0232	1.0135	0.3728	1.3862	0.2804	0.3555	0.6359	0.0000	2,075.7435	2,075.7435	0.2570	0.0000	2,082.1688
2021	4.0866	6.3603	7.8290	0.0181	0.7086	0.2396	0.9482	0.1903	0.2295	0.4198	0.0000	1,617.4783	1,617.4783	0.1831	0.0000	1,622.0566
2022	2.9613	0.4398	0.6702	1.4300e-003	0.0674	0.0178	0.0851	0.0179	0.0168	0.0347	0.0000	125.8416	125.8416	0.0187	0.0000	126.3098
Maximum	**4.0866**	**9.6353**	**9.8653**	**0.0232**	**1.0135**	**0.3728**	**1.3862**	**0.2804**	**0.3555**	**0.6359**	**0.0000**	**2,075.7435**	**2,075.7435**	**0.2570**	**0.0000**	**2,082.1688**

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					
2019	0.0792	1.5683	1.5840	3.7400e-003	0.0967	0.0471	0.1437	0.0270	0.0470	0.0740	0.0000	334.8640	334.8640	0.0694	0.0000	336.5978
2020	0.6730	7.0788	10.5491	0.0232	0.8505	0.1633	1.0137	0.2300	0.1623	0.3923	0.0000	2,051.3162	2,051.3162	0.2545	0.0000	2,057.6782
2021	3.7627	5.0633	8.3056	0.0181	0.7086	0.1137	0.8223	0.1903	0.1131	0.3033	0.0000	1,599.5829	1,599.5829	0.1813	0.0000	1,604.1147
2022	2.9367	0.3585	0.7362	1.4300e-003	0.0674	0.0130	0.0804	0.0179	0.0130	0.0309	0.0000	125.1704	125.1704	0.0187	0.0000	125.6369
Maximum	**3.7627**	**7.0788**	**10.5491**	**0.0232**	**0.8505**	**0.1633**	**1.0137**	**0.2300**	**0.1623**	**0.3923**	**0.0000**	**2,051.3162**	**2,051.3162**	**0.2545**	**0.0000**	**2,057.6782**

	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	N20	CO2e
Percent Reduction	**11.52**	**25.40**	**-7.71**	**0.00**	**16.65**	**52.96**	**25.99**	**18.30**	**50.84**	**36.04**	**0.00**	**1.13**	**1.13**	**0.92**	**0.00**	**1.13**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
2	**11-1-2019**	**1-31-2020**	4.5257	2.9266
3	**2-1-2020**	**4-30-2020**	2.4015	1.7466
4	**5-1-2020**	**7-31-2020**	2.4315	1.7620
5	**8-1-2020**	**10-31-2020**	2.4433	1.7738
6	**11-1-2020**	**1-31-2021**	2.3833	1.7747
7	**2-1-2021**	**4-30-2021**	2.1372	1.6643
8	**5-1-2021**	**7-31-2021**	2.8159	2.3048
9	**8-1-2021**	**10-31-2021**	3.4826	3.0550
10	**11-1-2021**	**1-31-2022**	1.8579	1.7984
11	**2-1-2022**	**4-30-2022**	1.8796	1.8117
12	**5-1-2022**	**7-31-2022**	0.9186	0.8957
		Highest	4.5257	3.0550

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	11/1/2019	11/28/2019	5	20	4 weeks
2	Grading	Grading	11/29/2019	1/30/2020	5	45	12 weeks
3	Building Construction	Building Construction	1/31/2020	10/7/2021	5	440	89 weeks
4	Paving	Paving	2/8/2022	2/28/2022	5	15	3 weeks
5	Architectural Coating	Architectural Coating	7/1/2021	6/15/2022	5	250	50 weeks

Acres of Grading (Site Preparation Phase): 35

Acres of Grading (Grading Phase): 204.75

Acres of Paving: 0

Residential Indoor: 1,961,640; Residential Outdoor: 653,880; Non-Residential Indoor: 5,250; Non-Residential Outdoor: 1,750; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Crawler Tractors	2	5.60	212	0.43
Site Preparation	Excavators	2	5.60	158	0.38
Site Preparation	Generator Sets	1	5.60	84	0.74
Site Preparation	Graders	1	5.60	187	0.41
Site Preparation	Off-Highway Tractors	1	5.60	124	0.44
Site Preparation	Off-Highway Trucks	1	5.60	402	0.38
Site Preparation	Pumps	1	5.60	84	0.74
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Rubber Tired Loaders	1	5.60	203	0.36
Site Preparation	Scrapers	1	5.60	367	0.48
Site Preparation	Signal Boards	2	8.00	6	0.82

Site Preparation	Skid Steer Loaders	1	5.60	65	0.37
Site Preparation	Sweepers/Scrubbers	1	2.00	64	0.46
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Grading	Crawler Tractors	4	5.60	212	0.43
Grading	Excavators	4	5.60	158	0.38
Grading	Generator Sets	1	5.60	84	0.74
Grading	Graders	3	5.60	187	0.41
Grading	Off-Highway Tractors	2	5.60	124	0.44
Grading	Off-Highway Trucks	2	5.60	402	0.38
Grading	Plate Compactors	6	5.60	8	0.43
Grading	Pumps	2	5.60	84	0.74
Grading	Rollers	2	5.60	80	0.38
Grading	Rough Terrain Forklifts	1	5.60	100	0.40
Grading	Rubber Tired Dozers	2	5.60	247	0.40
Grading	Rubber Tired Loaders	3	5.60	247	0.40
Grading	Scrapers	3	5.60	367	0.48
Grading	Signal Boards	6	8.00	6	0.82
Grading	Skid Steer Loaders	2	5.60	65	0.37
Grading	Sweepers/Scrubbers	2	2.00	64	0.46
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Aerial Lifts	12	3.20	63	0.31
Building Construction	Air Compressors	6	3.20	78	0.48
Building Construction	Concrete/Industrial Saws	4	3.20	81	0.73
Building Construction	Cranes	3	3.20	231	0.29
Building Construction	Forklifts	2	3.20	89	0.20
Building Construction	Generator Sets	4	3.20	84	0.74
Building Construction	Other Construction Equipment	6	3.20	172	0.42
Building Construction	Pressure Washers	1	3.20	13	0.30
Building Construction	Pumps	2	3.20	84	0.74
Building Construction	Rough Terrain Forklifts	4	3.20	100	0.40

Building Construction	Signal Boards	4	8.00	6	0.82
Building Construction	Skid Steer Loaders	2	3.20	65	0.37
Building Construction	Sweepers/Scrubbers	1	2.00	64	0.46
Building Construction	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Paving	Pavers	1	5.60	130	0.42
Paving	Paving Equipment	1	5.60	132	0.36
Paving	Plate Compactors	2	5.60	8	0.43
Paving	Rollers	1	5.60	80	0.38
Paving	Rubber Tired Loaders	1	5.60	203	0.36
Paving	Signal Boards	2	8.00	6	0.82
Paving	Skid Steer Loaders	1	5.60	65	0.37
Paving	Sweepers/Scrubbers	1	2.00	64	0.46
Architectural Coating	Aerial Lifts	8	1.20	63	0.31
Architectural Coating	Air Compressors	2	1.20	78	0.48
Architectural Coating	Cement and Mortar Mixers	6	1.20	9	0.56
Architectural Coating	Cranes	1	1.20	231	0.29
Architectural Coating	Generator Sets	2	1.20	84	0.74
Architectural Coating	Other Construction Equipment	2	1.20	172	0.42
Architectural Coating	Pressure Washers	1	1.20	13	0.30
Architectural Coating	Rough Terrain Forklifts	2	1.20	100	0.40
Architectural Coating	Graders	1	1.20	187	0.41
Paving	Graders	1	5.60	187	0.41

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
Site Preparation	15	38.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	45	113.00	0.00	5,000.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	51	698.00	121.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Paving	11	28.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	25	140.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2019

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					0.0186	0.0000	0.0186	2.0000e-003	0.0000	2.0000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0417	0.4662	0.2858	6.3000e-004		0.0195	0.0195		0.0182	0.0182	0.0000	55.9298	55.9298	0.0155	0.0000	56.3178
Total	**0.0417**	**0.4662**	**0.2858**	**6.3000e-004**	**0.0186**	**0.0195**	**0.0380**	**2.0000e-003**	**0.0182**	**0.0202**	**0.0000**	**55.9298**	**55.9298**	**0.0155**	**0.0000**	**56.3178**

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					

	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
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	1.8200e-003	1.7100e-003	0.0152	3.0000e-005	3.0200e-003	3.0000e-005	3.0500e-003	8.0000e-004	2.0000e-005	8.3000e-004	0.0000	2.8945	2.8945	1.4000e-004	0.0000	2.8979
Total	**1.8200e-003**	**1.7100e-003**	**0.0152**	**3.0000e-005**	**3.0200e-003**	**3.0000e-005**	**3.0500e-003**	**8.0000e-004**	**2.0000e-005**	**8.3000e-004**	**0.0000**	**2.8945**	**2.8945**	**1.4000e-004**	**0.0000**	**2.8979**

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					3.7600e-003	0.0000	3.7600e-003	4.1000e-004	0.0000	4.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0146	0.2839	0.3645	6.3000e-004		0.0105	0.0105		0.0105	0.0105	0.0000	55.0350	55.0350	0.0154	0.0000	55.4206
Total	**0.0146**	**0.2839**	**0.3645**	**6.3000e-004**	**3.7600e-003**	**0.0105**	**0.0143**	**4.1000e-004**	**0.0105**	**0.0110**	**0.0000**	**55.0350**	**55.0350**	**0.0154**	**0.0000**	**55.4206**

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	1.8200e-003	1.7100e-003	0.0152	3.0000e-005	3.0200e-003	3.0000e-005	3.0500e-003	8.0000e-004	2.0000e-005	8.3000e-004	0.0000	2.8945	2.8945	1.4000e-004	0.0000	2.8979
Total	**1.8200e-003**	**1.7100e-003**	**0.0152**	**3.0000e-005**	**3.0200e-003**	**3.0000e-005**	**3.0500e-003**	**8.0000e-004**	**2.0000e-005**	**8.3000e-004**	**0.0000**	**2.8945**	**2.8945**	**1.4000e-004**	**0.0000**	**2.8979**

3.3 Grading - 2019

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					0.2086	0.0000	0.2086	0.0655	0.0000	0.0655	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1376	1.5444	0.8701	1.9200e-003		0.0647	0.0647		0.0601	0.0601	0.0000	170.3051	170.3051	0.0495	0.0000	171.5422
Total	**0.1376**	**1.5444**	**0.8701**	**1.9200e-003**	**0.2086**	**0.0647**	**0.2734**	**0.0655**	**0.0601**	**0.1256**	**0.0000**	**170.3051**	**170.3051**	**0.0495**	**0.0000**	**171.5422**

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	0.0121	0.4058	0.0718	1.0400e-003	0.0373	2.0100e-003	0.0393	9.7900e-003	1.9300e-003	0.0117	0.0000	99.8179	99.8179	4.1700e-003	0.0000	99.9220
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	6.2200e-003	5.8400e-003	0.0520	1.1000e-004	0.0103	9.0000e-005	0.0104	2.7500e-003	9.0000e-005	2.8300e-003	0.0000	9.8985	9.8985	4.6000e-004	0.0000	9.9101
Total	**0.0183**	**0.4116**	**0.1238**	**1.1500e-003**	**0.0476**	**2.1000e-003**	**0.0497**	**0.0125**	**2.0200e-003**	**0.0146**	**0.0000**	**109.7164**	**109.7164**	**4.6300e-003**	**0.0000**	**109.8321**

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					0.0423	0.0000	0.0423	0.0133	0.0000	0.0133	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0445	0.8711	1.0804	1.9200e-003		0.0344	0.0344		0.0344	0.0344	0.0000	167.2181	167.2181	0.0492	0.0000	168.4472
Total	**0.0445**	**0.8711**	**1.0804**	**1.9200e-003**	**0.0423**	**0.0344**	**0.0767**	**0.0133**	**0.0344**	**0.0477**	**0.0000**	**167.2181**	**167.2181**	**0.0492**	**0.0000**	**168.4472**

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	0.0121	0.4058	0.0718	1.0400e-003	0.0373	2.0100e-003	0.0393	9.7900e-003	1.9300e-003	0.0117	0.0000	99.8179	99.8179	4.1700e-003	0.0000	99.9220
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	6.2200e-003	5.8400e-003	0.0520	1.1000e-004	0.0103	9.0000e-005	0.0104	2.7500e-003	9.0000e-005	2.8300e-003	0.0000	9.8985	9.8985	4.6000e-004	0.0000	9.9101
Total	**0.0183**	**0.4116**	**0.1238**	**1.1500e-003**	**0.0476**	**2.1000e-003**	**0.0497**	**0.0125**	**2.0200e-003**	**0.0146**	**0.0000**	**109.7164**	**109.7164**	**4.6300e-003**	**0.0000**	**109.8321**

3.3 Grading - 2020

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					0.2044	0.0000	0.2044	0.0632	0.0000	0.0632	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	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
Off-Road	0.1240	1.3647	0.8081	1.8400e-003		0.0567	0.0567		0.0526	0.0526	0.0000	159.7152	159.7152	0.0472	0.0000	160.8960
Total	**0.1240**	**1.3647**	**0.8081**	**1.8400e-003**	**0.2044**	**0.0567**	**0.2611**	**0.0632**	**0.0526**	**0.1158**	**0.0000**	**159.7152**	**159.7152**	**0.0472**	**0.0000**	**160.8960**

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	0.0102	0.3585	0.0633	9.9000e-004	0.0371	1.4000e-003	0.0385	9.7100e-003	1.3400e-003	0.0111	0.0000	94.5923	94.5923	3.8000e-003	0.0000	94.6873
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	5.4000e-003	4.9300e-003	0.0442	1.0000e-004	9.8900e-003	8.0000e-005	9.9700e-003	2.6300e-003	8.0000e-005	2.7100e-003	0.0000	9.1825	9.1825	3.8000e-004	0.0000	9.1921
Total	**0.0156**	**0.3635**	**0.1075**	**1.0900e-003**	**0.0469**	**1.4800e-003**	**0.0484**	**0.0123**	**1.4200e-003**	**0.0138**	**0.0000**	**103.7748**	**103.7748**	**4.1800e-003**	**0.0000**	**103.8794**

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					0.0414	0.0000	0.0414	0.0128	0.0000	0.0128	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0426	0.8332	1.0335	1.8400e-003		0.0329	0.0329		0.0329	0.0329	0.0000	156.7624	156.7624	0.0469	0.0000	157.9355
Total	**0.0426**	**0.8332**	**1.0335**	**1.8400e-003**	**0.0414**	**0.0329**	**0.0743**	**0.0128**	**0.0329**	**0.0457**	**0.0000**	**156.7624**	**156.7624**	**0.0469**	**0.0000**	**157.9355**

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	0.0102	0.3585	0.0633	9.9000e-004	0.0371	1.4000e-003	0.0385	9.7100e-003	1.3400e-003	0.0111	0.0000	94.5923	94.5923	3.8000e-003	0.0000	94.6873
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	5.4000e-003	4.9300e-003	0.0442	1.0000e-004	9.8900e-003	8.0000e-005	9.9700e-003	2.6300e-003	8.0000e-005	2.7100e-003	0.0000	9.1825	9.1825	3.8000e-004	0.0000	9.1921
Total	**0.0156**	**0.3635**	**0.1075**	**1.0900e-003**	**0.0469**	**1.4800e-003**	**0.0484**	**0.0123**	**1.4200e-003**	**0.0138**	**0.0000**	**103.7748**	**103.7748**	**4.1800e-003**	**0.0000**	**103.8794**

3.4 Building Construction - 2020

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	0.6058	5.7585	5.5094	9.2600e-003		0.2987	0.2987		0.2864	0.2864	0.0000	796.7966	796.7966	0.1584	0.0000	800.7554
Total	**0.6058**	**5.7585**	**5.5094**	**9.2600e-003**		**0.2987**	**0.2987**		**0.2864**	**0.2864**	**0.0000**	**796.7966**	**796.7966**	**0.1584**	**0.0000**	**800.7554**

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	0.0655	1.8163	0.4635	4.1700e-003	0.0958	0.0102	0.1060	0.0277	9.7700e-003	0.0374	0.0000	396.6900	396.6900	0.0215	0.0000	397.2262
Worker	0.3636	0.3322	2.9769	6.8600e-003	0.6664	5.7200e-003	0.6721	0.1772	5.2800e-003	0.1825	0.0000	618.7670	618.7670	0.0258	0.0000	619.4119
Total	**0.4291**	**2.1485**	**3.4404**	**0.0110**	**0.7621**	**0.0159**	**0.7781**	**0.2049**	**0.0151**	**0.2199**	**0.0000**	**1,015.4570**	**1,015.4570**	**0.0472**	**0.0000**	**1,016.6381**

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	0.1858	3.7335	5.9678	9.2600e-003		0.1129	0.1129		0.1129	0.1129	0.0000	775.3221	775.3221	0.1561	0.0000	779.2252
Total	**0.1858**	**3.7335**	**5.9678**	**9.2600e-003**		**0.1129**	**0.1129**		**0.1129**	**0.1129**	**0.0000**	**775.3221**	**775.3221**	**0.1561**	**0.0000**	**779.2252**

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	0.0655	1.8163	0.4635	4.1700e-003	0.0958	0.0102	0.1060	0.0277	9.7700e-003	0.0374	0.0000	396.6900	396.6900	0.0215	0.0000	397.2262
Worker	0.3636	0.3322	2.9769	6.8600e-003	0.6664	5.7200e-003	0.6721	0.1772	5.2800e-003	0.1825	0.0000	618.7670	618.7670	0.0258	0.0000	619.4119
Total	**0.4291**	**2.1485**	**3.4404**	**0.0110**	**0.7621**	**0.0159**	**0.7781**	**0.2049**	**0.0151**	**0.2199**	**0.0000**	**1,015.4570**	**1,015.4570**	**0.0472**	**0.0000**	**1,016.6381**

3.4 Building Construction - 2021

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	0.4541	4.2997	4.5452	7.7200e-003		0.2128	0.2128		0.2042	0.2042	0.0000	663.9458	663.9458	0.1301	0.0000	667.1971
Total	**0.4541**	**4.2997**	**4.5452**	**7.7200e-003**		**0.2128**	**0.2128**		**0.2042**	**0.2042**	**0.0000**	**663.9458**	**663.9458**	**0.1301**	**0.0000**	**667.1971**

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	0.0447	1.3802	0.3355	3.4400e-003	0.0798	4.1900e-003	0.0840	0.0231	4.0100e-003	0.0271	0.0000	327.7187	327.7187	0.0173	0.0000	328.1509
Worker	0.2802	0.2471	2.2583	5.5300e-003	0.5553	4.6300e-003	0.5599	0.1477	4.2700e-003	0.1519	0.0000	499.4937	499.4937	0.0192	0.0000	499.9741
Total	**0.3249**	**1.6273**	**2.5937**	**8.9700e-003**	**0.6351**	**8.8200e-003**	**0.6439**	**0.1707**	**8.2800e-003**	**0.1790**	**0.0000**	**827.2124**	**827.2124**	**0.0365**	**0.0000**	**828.1251**

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	0.1548	3.1113	4.9732	7.7200e-003		0.0941	0.0941		0.0941	0.0941	0.0000	646.0505	646.0505	0.1282	0.0000	649.2553
Total	**0.1548**	**3.1113**	**4.9732**	**7.7200e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**646.0505**	**646.0505**	**0.1282**	**0.0000**	**649.2553**

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	0.0447	1.3802	0.3355	3.4400e-003	0.0798	4.1900e-003	0.0840	0.0231	4.0100e-003	0.0271	0.0000	327.7187	327.7187	0.0173	0.0000	328.1509
Worker	0.2802	0.2471	2.2583	5.5300e-003	0.5553	4.6300e-003	0.5599	0.1477	4.2700e-003	0.1519	0.0000	499.4937	499.4937	0.0192	0.0000	499.9741
Total	**0.3249**	**1.6273**	**2.5937**	**8.9700e-003**	**0.6351**	**8.8200e-003**	**0.6439**	**0.1707**	**8.2800e-003**	**0.1790**	**0.0000**	**827.2124**	**827.2124**	**0.0365**	**0.0000**	**828.1251**

3.5 Paving - 2022

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	8.6100e-003	0.0889	0.0729	1.6000e-004		3.6200e-003	3.6200e-003		3.3500e-003	3.3500e-003	0.0000	13.5590	13.5590	4.1700e-003	0.0000	13.6632

	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
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.6100e-003**	**0.0889**	**0.0729**	**1.6000e-004**		**3.6200e-003**	**3.6200e-003**		**3.3500e-003**	**3.3500e-003**	**0.0000**	**13.5590**	**13.5590**	**4.1700e-003**	**0.0000**	**13.6632**

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	7.8000e-004	6.7000e-004	6.1900e-003	2.0000e-005	1.6700e-003	1.0000e-005	1.6800e-003	4.4000e-004	1.0000e-005	4.6000e-004	0.0000	1.4498	1.4498	5.0000e-005	0.0000	1.4511
Total	**7.8000e-004**	**6.7000e-004**	**6.1900e-003**	**2.0000e-005**	**1.6700e-003**	**1.0000e-005**	**1.6800e-003**	**4.4000e-004**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**1.4498**	**1.4498**	**5.0000e-005**	**0.0000**	**1.4511**

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	3.5200e-003	0.0705	0.0932	1.6000e-004		3.4300e-003	3.4300e-003		3.4300e-003	3.4300e-003	0.0000	12.8880	12.8880	4.1000e-003	0.0000	12.9904
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.5200e-003**	**0.0705**	**0.0932**	**1.6000e-004**		**3.4300e-003**	**3.4300e-003**		**3.4300e-003**	**3.4300e-003**	**0.0000**	**12.8880**	**12.8880**	**4.1000e-003**	**0.0000**	**12.9904**

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	7.8000e-004	6.7000e-004	6.1900e-003	2.0000e-005	1.6700e-003	1.0000e-005	1.6800e-003	4.4000e-004	1.0000e-005	4.6000e-004	0.0000	1.4498	1.4498	5.0000e-005	0.0000	1.4511
Total	**7.8000e-004**	**6.7000e-004**	**6.1900e-003**	**2.0000e-005**	**1.6700e-003**	**1.0000e-005**	**1.6800e-003**	**4.4000e-004**	**1.0000e-005**	**4.6000e-004**	**0.0000**	**1.4498**	**1.4498**	**5.0000e-005**	**0.0000**	**1.4511**

3.6 Architectural Coating - 2021

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	3.2315					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0391	0.4006	0.3911	7.0000e-004		0.0173	0.0173		0.0164	0.0164	0.0000	60.1980	60.1980	0.0140	0.0000	60.5487
Total	**3.2706**	**0.4006**	**0.3911**	**7.0000e-004**		**0.0173**	**0.0173**		**0.0164**	**0.0164**	**0.0000**	**60.1980**	**60.1980**	**0.0140**	**0.0000**	**60.5487**

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	0.0371	0.0327	0.2989	7.3000e-004	0.0735	6.1000e-004	0.0741	0.0196	5.7000e-004	0.0201	0.0000	66.1221	66.1221	2.5400e-003	0.0000	66.1857
Total	**0.0371**	**0.0327**	**0.2989**	**7.3000e-004**	**0.0735**	**6.1000e-004**	**0.0741**	**0.0196**	**5.7000e-004**	**0.0201**	**0.0000**	**66.1221**	**66.1221**	**2.5400e-003**	**0.0000**	**66.1857**

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	3.2315					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0143	0.2920	0.4398	7.0000e-004		0.0101	0.0101		0.0101	0.0101	0.0000	60.1979	60.1979	0.0140	0.0000	60.5486
Total	**3.2459**	**0.2920**	**0.4398**	**7.0000e-004**		**0.0101**	**0.0101**		**0.0101**	**0.0101**	**0.0000**	**60.1979**	**60.1979**	**0.0140**	**0.0000**	**60.5486**

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	0.0371	0.0327	0.2989	7.3000e-004	0.0735	6.1000e-004	0.0741	0.0196	5.7000e-004	0.0201	0.0000	66.1221	66.1221	2.5400e-003	0.0000	66.1857
Total	**0.0371**	**0.0327**	**0.2989**	**7.3000e-004**	**0.0735**	**6.1000e-004**	**0.0741**	**0.0196**	**5.7000e-004**	**0.0201**	**0.0000**	**66.1221**	**66.1221**	**2.5400e-003**	**0.0000**	**66.1857**

3.6 Architectural Coating - 2022

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	2.8888					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0323	0.3241	0.3474	6.3000e-004		0.0136	0.0136		0.0129	0.0129	0.0000	53.8075	53.8075	0.0125	0.0000	54.1195
Total	**2.9211**	**0.3241**	**0.3474**	**6.3000e-004**		**0.0136**	**0.0136**		**0.0129**	**0.0129**	**0.0000**	**53.8075**	**53.8075**	**0.0125**	**0.0000**	**54.1195**

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	0.0308	0.0262	0.2437	6.3000e-004	0.0657	5.3000e-004	0.0662	0.0175	4.9000e-004	0.0180	0.0000	57.0252	57.0252	2.0300e-003	0.0000	57.0760
Total	**0.0308**	**0.0262**	**0.2437**	**6.3000e-004**	**0.0657**	**5.3000e-004**	**0.0662**	**0.0175**	**4.9000e-004**	**0.0180**	**0.0000**	**57.0252**	**57.0252**	**2.0300e-003**	**0.0000**	**57.0760**

Mitigated Construction On-Site

Category	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
	tons/yr										MT/yr					
Archit. Coating	2.8888					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0128	0.2611	0.3931	6.3000e-004		9.0400e-003	9.0400e-003		9.0400e-003	9.0400e-003	0.0000	53.8074	53.8074	0.0125	0.0000	54.1195
Total	**2.9016**	**0.2611**	**0.3931**	**6.3000e-004**		**9.0400e-003**	**9.0400e-003**		**9.0400e-003**	**9.0400e-003**	**0.0000**	**53.8074**	**53.8074**	**0.0125**	**0.0000**	**54.1195**

Mitigated Construction Off-Site

Category	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
	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	0.0308	0.0262	0.2437	6.3000e-004	0.0657	5.3000e-004	0.0662	0.0175	4.9000e-004	0.0180	0.0000	57.0252	57.0252	2.0300e-003	0.0000	57.0760
Total	**0.0308**	**0.0262**	**0.2437**	**6.3000e-004**	**0.0657**	**5.3000e-004**	**0.0662**	**0.0175**	**4.9000e-004**	**0.0180**	**0.0000**	**57.0252**	**57.0252**	**2.0300e-003**	**0.0000**	**57.0760**

UCSC Student Housing Heller Site

Monterey Bay Unified APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	3.50	1000sqft	0.00	3,500.00	0
Parking Lot	414.00	Space	0.00	165,600.00	0
Apartments Low Rise	146.00	Dwelling Unit	9.13	67,932.00	418
Apartments Mid Rise	725.00	Dwelling Unit	19.08	900,779.00	2074

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.8	**Precipitation Freq (Days)**	53
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Using PG&E 2020 rate

Land Use - Based on project description. Wastewater added as Industrial use. Sf total = 968,711

Construction Phase - Based on durations provided and construction schedule

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on provided list

Trips and VMT -

Grading - Set to default acreage and used max.import/export quantities

Energy Use -

Water And Wastewater - Wastewater treatment, no septic or lagoons. 31,200,000 gallons potable water (2,187,938/29,012,062)

Solid Waste - Solidwate projection similar to project description

Construction Off-road Equipment Mitigation - Tier 4i portable/Tier 3 mobile and BMPs for fugitive dust

Mobile Land Use Mitigation -

Energy Mitigation -

Water Mitigation -

Demolition -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	20.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
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tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
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tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
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tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstructionPhase	NumDays	35.00	15.00
tblConstructionPhase	NumDays	35.00	250.00
tblConstructionPhase	PhaseEndDate	8/28/2019	11/28/2019
tblConstructionPhase	PhaseEndDate	10/30/2019	1/30/2020
tblConstructionPhase	PhaseEndDate	7/7/2021	10/7/2021
tblConstructionPhase	PhaseEndDate	8/25/2021	2/28/2022
tblConstructionPhase	PhaseEndDate	10/13/2021	6/15/2022
tblConstructionPhase	PhaseStartDate	8/1/2019	11/1/2019
tblConstructionPhase	PhaseStartDate	8/29/2019	11/29/2019
tblConstructionPhase	PhaseStartDate	10/31/2019	1/31/2020
tblConstructionPhase	PhaseStartDate	7/8/2021	2/8/2022
tblConstructionPhase	PhaseStartDate	8/26/2021	7/1/2021
tblGrading	MaterialImported	0.00	40,000.00
tblLandUse	LandUseSquareFeet	146,000.00	67,932.00
tblLandUse	LandUseSquareFeet	725,000.00	900,779.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	3.73	0.00
tblOffRoadEquipment	HorsePower	203.00	247.00
tblOffRoadEquipment	LoadFactor	0.36	0.40
tblOffRoadEquipment	LoadFactor	0.41	0.41
tblOffRoadEquipment	LoadFactor	0.41	0.41
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentType		Graders
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	1.20
tblOffRoadEquipment	UsageHours	7.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	3.20
tblOffRoadEquipment	UsageHours	8.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00

tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	9,512,487.74	2,187,938.00
tblWater	IndoorWaterUseRate	47,236,668.58	29,012,062.00
tblWater	OutdoorWaterUseRate	5,997,003.14	0.00
tblWater	OutdoorWaterUseRate	29,779,638.88	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	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					
2019	13.5475	169.3463	86.3583	0.2688	17.6689	5.8095	23.4784	6.2994	5.4004	11.6999	0.0000	26,981.9207	26,981.9207	5.1732	0.0000	27,111.2516
2020	12.6792	156.4553	83.1797	0.2676	17.7996	5.2848	23.0844	6.3315	4.9109	11.2424	0.0000	26,545.2993	26,545.2993	5.1393	0.0000	26,673.7826
2021	57.9160	65.3308	82.9537	0.1930	7.7032	2.4868	10.1900	2.0618	2.3817	4.4435	0.0000	18,986.2727	18,986.2727	2.1165	0.0000	19,039.1848
2022	51.2883	17.8109	20.8256	0.0454	1.3801	0.7235	2.1036	0.3661	0.6763	1.0423	0.0000	4,352.2552	4,352.2552	0.8933	0.0000	4,374.5879
Maximum	**57.9160**	**169.3463**	**86.3583**	**0.2688**	**17.7996**	**5.8095**	**23.4784**	**6.3315**	**5.4004**	**11.6999**	**0.0000**	**26,981.9207**	**26,981.9207**	**5.1732**	**0.0000**	**27,111.2516**

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					
2019	5.4499	110.8008	104.6505	0.2688	6.9874	3.1743	10.1616	2.1714	3.1661	5.3376	0.0000	26,686.0394	26,686.0394	5.1425	0.0000	26,814.6023
2020	5.2762	108.1392	103.6653	0.2676	7.1181	3.1270	10.2451	2.2035	3.1210	5.3245	0.0000	26,249.4180	26,249.4180	5.1086	0.0000	26,377.1334
2021	54.5490	51.8018	87.9713	0.1930	7.7032	1.1909	8.8941	2.0618	1.1848	3.2466	0.0000	18,789.0185	18,789.0185	2.0960	0.0000	18,841.4186
2022	50.2793	14.2959	24.3079	0.0454	1.3801	0.6215	2.0016	0.3661	0.6207	0.9868	0.0000	4,253.6279	4,253.6279	0.8831	0.0000	4,275.7046
Maximum	**54.5490**	**110.8008**	**104.6505**	**0.2688**	**7.7032**	**3.1743**	**10.2451**	**2.2035**	**3.1661**	**5.3376**	**0.0000**	**26,686.0394**	**26,686.0394**	**5.1425**	**0.0000**	**26,814.6023**

	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**	**N20**	**CO2e**
Percent Reduction	**14.68**	**30.30**	**-17.30**	**0.00**	**47.95**	**43.28**	**46.82**	**54.83**	**39.47**	**47.60**	**0.00**	**1.15**	**1.15**	**0.69**	**0.00**	**1.15**

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	11/1/2019	11/28/2019	5	20	4 weeks
2	Grading	Grading	11/29/2019	1/30/2020	5	45	12 weeks
3	Building Construction	Building Construction	1/31/2020	10/7/2021	5	440	89 weeks
4	Paving	Paving	2/8/2022	2/28/2022	5	15	3 weeks
5	Architectural Coating	Architectural Coating	7/1/2021	6/15/2022	5	250	50 weeks

Acres of Grading (Site Preparation Phase): 35

Acres of Grading (Grading Phase): 204.75

Acres of Paving: 0

Residential Indoor: 1,961,640; Residential Outdoor: 653,880; Non-Residential Indoor: 5,250; Non-Residential Outdoor: 1,750; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Crawler Tractors	2	5.60	212	0.43
Site Preparation	Excavators	2	5.60	158	0.38
Site Preparation	Generator Sets	1	5.60	84	0.74
Site Preparation	Graders	1	5.60	187	0.41
Site Preparation	Off-Highway Tractors	1	5.60	124	0.44
Site Preparation	Off-Highway Trucks	1	5.60	402	0.38
Site Preparation	Pumps	1	5.60	84	0.74
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Rubber Tired Loaders	1	5.60	203	0.36
Site Preparation	Scrapers	1	5.60	367	0.48
Site Preparation	Signal Boards	2	8.00	6	0.82
Site Preparation	Skid Steer Loaders	1	5.60	65	0.37
Site Preparation	Sweepers/Scrubbers	1	2.00	64	0.46
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Grading	Crawler Tractors	4	5.60	212	0.43
Grading	Excavators	4	5.60	158	0.38
Grading	Generator Sets	1	5.60	84	0.74
Grading	Graders	3	5.60	187	0.41
Grading	Off-Highway Tractors	2	5.60	124	0.44
Grading	Off-Highway Trucks	2	5.60	402	0.38
Grading	Plate Compactors	6	5.60	8	0.43
Grading	Pumps	2	5.60	84	0.74
Grading	Rollers	2	5.60	80	0.38
Grading	Rough Terrain Forklifts	1	5.60	100	0.40

Grading	Rubber Tired Dozers	2	5.60	247	0.40
Grading	Rubber Tired Loaders	3	5.60	247	0.40
Grading	Scrapers	3	5.60	367	0.48
Grading	Signal Boards	6	8.00	6	0.82
Grading	Skid Steer Loaders	2	5.60	65	0.37
Grading	Sweepers/Scrubbers	2	2.00	64	0.46
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Aerial Lifts	12	3.20	63	0.31
Building Construction	Air Compressors	6	3.20	78	0.48
Building Construction	Concrete/Industrial Saws	4	3.20	81	0.73
Building Construction	Cranes	3	3.20	231	0.29
Building Construction	Forklifts	2	3.20	89	0.20
Building Construction	Generator Sets	4	3.20	84	0.74
Building Construction	Other Construction Equipment	6	3.20	172	0.42
Building Construction	Pressure Washers	1	3.20	13	0.30
Building Construction	Pumps	2	3.20	84	0.74
Building Construction	Rough Terrain Forklifts	4	3.20	100	0.40
Building Construction	Signal Boards	4	8.00	6	0.82
Building Construction	Skid Steer Loaders	2	3.20	65	0.37
Building Construction	Sweepers/Scrubbers	1	2.00	64	0.46
Building Construction	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Paving	Pavers	1	5.60	130	0.42
Paving	Paving Equipment	1	5.60	132	0.36
Paving	Plate Compactors	2	5.60	8	0.43
Paving	Rollers	1	5.60	80	0.38
Paving	Rubber Tired Loaders	1	5.60	203	0.36
Paving	Signal Boards	2	8.00	6	0.82
Paving	Skid Steer Loaders	1	5.60	65	0.37
Paving	Sweepers/Scrubbers	1	2.00	64	0.46

Architectural Coating	Aerial Lifts	8	1.20	63	0.31
Architectural Coating	Air Compressors	2	1.20	78	0.48
Architectural Coating	Cement and Mortar Mixers	6	1.20	9	0.56
Architectural Coating	Cranes	1	1.20	231	0.29
Architectural Coating	Generator Sets	2	1.20	84	0.74
Architectural Coating	Other Construction Equipment	2	1.20	172	0.42
Architectural Coating	Pressure Washers	1	1.20	13	0.30
Architectural Coating	Rough Terrain Forklifts	2	1.20	100	0.40
Architectural Coating	Graders	1	1.20	187	0.41
Paving	Graders	1	5.60	187	0.41

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
Site Preparation	15	38.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	45	113.00	0.00	5,000.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	51	698.00	121.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	11	28.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	25	140.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2019

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					1.8559	0.0000	1.8559	0.2004	0.0000	0.2004			0.0000			0.0000
Off-Road	4.1653	46.6186	28.5783	0.0631		1.9472	1.9472		1.8196	1.8196		6,165.2079	6,165.2079	1.7105		6,207.9694
Total	**4.1653**	**46.6186**	**28.5783**	**0.0631**	**1.8559**	**1.9472**	**3.8031**	**0.2004**	**1.8196**	**2.0200**		**6,165.2079**	**6,165.2079**	**1.7105**		**6,207.9694**

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	0.1828	0.1494	1.5881	3.4000e-003	0.3122	2.7000e-003	0.3149	0.0828	2.4900e-003	0.0853		337.9085	337.9085	0.0155		338.2970
Total	**0.1828**	**0.1494**	**1.5881**	**3.4000e-003**	**0.3122**	**2.7000e-003**	**0.3149**	**0.0828**	**2.4900e-003**	**0.0853**		**337.9085**	**337.9085**	**0.0155**		**338.2970**

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					

Category	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
Fugitive Dust					0.3758	0.0000	0.3758	0.0406	0.0000	0.0406			0.0000			0.0000
Off-Road	1.4580	28.3883	36.4526	0.0631		1.0538	1.0538		1.0538	1.0538	0.0000	6,066.5808	6,066.5808	1.7002		6,109.0864
Total	**1.4580**	**28.3883**	**36.4526**	**0.0631**	**0.3758**	**1.0538**	**1.4296**	**0.0406**	**1.0538**	**1.0944**	**0.0000**	**6,066.5808**	**6,066.5808**	**1.7002**		**6,109.0864**

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	0.1828	0.1494	1.5881	3.4000e-003	0.3122	2.7000e-003	0.3149	0.0828	2.4900e-003	0.0853		337.9085	337.9085	0.0155		338.2970
Total	**0.1828**	**0.1494**	**1.5881**	**3.4000e-003**	**0.3122**	**2.7000e-003**	**0.3149**	**0.0828**	**2.4900e-003**	**0.0853**		**337.9085**	**337.9085**	**0.0155**		**338.2970**

3.3 Grading - 2019

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					13.3937	0.0000	13.3937	5.1762	0.0000	5.1762			0.0000			0.0000
Off-Road	11.9686	134.2942	75.6592	0.1672		5.6283	5.6283		5.2273	5.2273		16,324.2853	16,324.2853	4.7432		16,442.8640
Total	**11.9686**	**134.2942**	**75.6592**	**0.1672**	**13.3937**	**5.6283**	**19.0221**	**5.1762**	**5.2273**	**10.4035**		**16,324.2853**	**16,324.2853**	**4.7432**		**16,442.8640**

Unmitigated Construction Off-Site

Category	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
	lb/day										lb/day					
Hauling	1.0355	34.6078	5.9766	0.0915	3.3469	0.1732	3.5201	0.8770	0.1657	1.0428		9,652.8023	9,652.8023	0.3839		9,662.3990
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	0.5435	0.4443	4.7225	0.0101	0.9283	8.0200e-003	0.9363	0.2462	7.4000e-003	0.2536		1,004.8331	1,004.8331	0.0462		1,005.9885
Total	**1.5790**	**35.0521**	**10.6991**	**0.1016**	**4.2751**	**0.1812**	**4.4564**	**1.1233**	**0.1731**	**1.2964**		**10,657.6354**	**10,657.6354**	**0.4301**		**10,668.3876**

Mitigated Construction On-Site

Category	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
	lb/day										lb/day					
Fugitive Dust					2.7122	0.0000	2.7122	1.0482	0.0000	1.0482			0.0000			0.0000
Off-Road	3.8709	75.7488	93.9514	0.1672		2.9930	2.9930		2.9930	2.9930	0.0000	16,028.4040	16,028.4040	4.7124		16,146.2148
Total	**3.8709**	**75.7488**	**93.9514**	**0.1672**	**2.7122**	**2.9930**	**5.7053**	**1.0482**	**2.9930**	**4.0412**	**0.0000**	**16,028.4040**	**16,028.4040**	**4.7124**		**16,146.2148**

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	1.0355	34.6078	5.9766	0.0915	3.3469	0.1732	3.5201	0.8770	0.1657	1.0428		9,652.8023	9,652.8023	0.3839		9,662.3990
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	0.5435	0.4443	4.7225	0.0101	0.9283	8.0200e-003	0.9363	0.2462	7.4000e-003	0.2536		1,004.8331	1,004.8331	0.0462		1,005.9885
Total	**1.5790**	**35.0521**	**10.6991**	**0.1016**	**4.2751**	**0.1812**	**4.4564**	**1.1233**	**0.1731**	**1.2964**		**10,657.6354**	**10,657.6354**	**0.4301**		**10,668.3876**

3.3 Grading - 2020

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					13.3937	0.0000	13.3937	5.1762	0.0000	5.1762			0.0000			0.0000
Off-Road	11.2739	124.0649	73.4659	0.1672		5.1508	5.1508		4.7829	4.7829		16,005.0750	16,005.0750	4.7332		16,123.4044
Total	**11.2739**	**124.0649**	**73.4659**	**0.1672**	**13.3937**	**5.1508**	**18.5446**	**5.1762**	**4.7829**	**9.9591**		**16,005.0750**	**16,005.0750**	**4.7332**		**16,123.4044**

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	0.9117	31.9980	5.5076	0.0906	3.4776	0.1263	3.6039	0.9091	0.1208	1.0300		9,565.6272	9,565.6272	0.3660		9,574.7759
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	0.4936	0.3924	4.2062	9.8000e-003	0.9283	7.7200e-003	0.9360	0.2462	7.1300e-003	0.2534		974.5971	974.5971	0.0402		975.6024

	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
Total	**1.4053**	**32.3904**	**9.7139**	**0.1004**	**4.4059**	**0.1340**	**4.5399**	**1.1554**	**0.1280**	**1.2833**		**10,540.2243**	**10,540.2243**	**0.4062**		**10,550.3783**

<u>**Mitigated Construction On-Site**</u>

	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					2.7122	0.0000	2.7122	1.0482	0.0000	1.0482			0.0000			0.0000
Off-Road	3.8709	75.7488	93.9514	0.1672		2.9930	2.9930		2.9930	2.9930	0.0000	15,709.1937	15,709.1937	4.7025		15,826.7551
Total	**3.8709**	**75.7488**	**93.9514**	**0.1672**	**2.7122**	**2.9930**	**5.7053**	**1.0482**	**2.9930**	**4.0412**	**0.0000**	**15,709.1937**	**15,709.1937**	**4.7025**		**15,826.7551**

<u>**Mitigated Construction Off-Site**</u>

	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	0.9117	31.9980	5.5076	0.0906	3.4776	0.1263	3.6039	0.9091	0.1208	1.0300		9,565.6272	9,565.6272	0.3660		9,574.7759
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	0.4936	0.3924	4.2062	9.8000e-003	0.9283	7.7200e-003	0.9360	0.2462	7.1300e-003	0.2534		974.5971	974.5971	0.0402		975.6024
Total	**1.4053**	**32.3904**	**9.7139**	**0.1004**	**4.4059**	**0.1340**	**4.5399**	**1.1554**	**0.1280**	**1.2833**		**10,540.2243**	**10,540.2243**	**0.4062**		**10,550.3783**

3.4 Building Construction - 2020

<u>**Unmitigated Construction On-Site**</u>

	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	5.0483	47.9878	45.9115	0.0772		2.4890	2.4890		2.3870	2.3870		7,319.3156	7,319.3156	1.4546		7,355.6809
Total	**5.0483**	**47.9878**	**45.9115**	**0.0772**		**2.4890**	**2.4890**		**2.3870**	**2.3870**		**7,319.3156**	**7,319.3156**	**1.4546**		**7,355.6809**

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	0.5332	14.9610	3.6044	0.0352	0.8192	0.0842	0.9033	0.2358	0.0805	0.3163		3,692.4066	3,692.4066	0.1881		3,697.1101
Worker	3.0487	2.4235	25.9819	0.0605	5.7339	0.0477	5.7816	1.5209	0.0440	1.5649		6,020.0774	6,020.0774	0.2484		6,026.2871
Total	**3.5819**	**17.3846**	**29.5863**	**0.0957**	**6.5531**	**0.1319**	**6.6849**	**1.7567**	**0.1245**	**1.8812**		**9,712.4840**	**9,712.4840**	**0.4365**		**9,723.3972**

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	1.5480	31.1127	49.7320	0.0772		0.9411	0.9411		0.9411	0.9411	0.0000	7,122.0614	7,122.0614	1.4341		7,157.9147
Total	**1.5480**	**31.1127**	**49.7320**	**0.0772**		**0.9411**	**0.9411**		**0.9411**	**0.9411**	**0.0000**	**7,122.0614**	**7,122.0614**	**1.4341**		**7,157.9147**

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	0.5332	14.9610	3.6044	0.0352	0.8192	0.0842	0.9033	0.2358	0.0805	0.3163		3,692.4066	3,692.4066	0.1881		3,697.1101
Worker	3.0487	2.4235	25.9819	0.0605	5.7339	0.0477	5.7816	1.5209	0.0440	1.5649		6,020.0774	6,020.0774	0.2484		6,026.2871
Total	**3.5819**	**17.3846**	**29.5863**	**0.0957**	**6.5531**	**0.1319**	**6.6849**	**1.7567**	**0.1245**	**1.8812**		**9,712.4840**	**9,712.4840**	**0.4365**		**9,723.3972**

3.4 Building Construction - 2021

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	4.5405	42.9967	45.4517	0.0772		2.1284	2.1284		2.0422	2.0422		7,318.7500	7,318.7500	1.4336		7,354.5895
Total	**4.5405**	**42.9967**	**45.4517**	**0.0772**		**2.1284**	**2.1284**		**2.0422**	**2.0422**		**7,318.7500**	**7,318.7500**	**1.4336**		**7,354.5895**

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	0.4353	13.6665	3.1165	0.0349	0.8192	0.0411	0.8603	0.2358	0.0393	0.2751		3,660.8280	3,660.8280	0.1816		3,665.3690
Worker	2.8201	2.1639	23.7051	0.0586	5.7339	0.0463	5.7802	1.5209	0.0427	1.5636		5,831.6207	5,831.6207	0.2224		5,837.1803
Total	**3.2554**	**15.8304**	**26.8216**	**0.0935**	**6.5531**	**0.0874**	**6.6405**	**1.7567**	**0.0820**	**1.8387**		**9,492.4487**	**9,492.4487**	**0.4040**		**9,502.5493**

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	1.5480	31.1127	49.7320	0.0772		0.9411	0.9411		0.9411	0.9411	0.0000	7,121.4958	7,121.4958	1.4131		7,156.8233
Total	**1.5480**	**31.1127**	**49.7320**	**0.0772**		**0.9411**	**0.9411**		**0.9411**	**0.9411**	**0.0000**	**7,121.4958**	**7,121.4958**	**1.4131**		**7,156.8233**

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	0.4353	13.6665	3.1165	0.0349	0.8192	0.0411	0.8603	0.2358	0.0393	0.2751		3,660.8280	3,660.8280	0.1816		3,665.3690
Worker	2.8201	2.1639	23.7051	0.0586	5.7339	0.0463	5.7802	1.5209	0.0427	1.5636		5,831.6207	5,831.6207	0.2224		5,837.1803
Total	**3.2554**	**15.8304**	**26.8216**	**0.0935**	**6.5531**	**0.0874**	**6.6405**	**1.7567**	**0.0820**	**1.8387**		**9,492.4487**	**9,492.4487**	**0.4040**		**9,502.5493**

3.5 Paving - 2022

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	1.1475	11.8512	9.7234	0.0211		0.4824	0.4824		0.4471	0.4471		1,992.8344	1,992.8344	0.6123		2,008.1410
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1475**	**11.8512**	**9.7234**	**0.0211**		**0.4824**	**0.4824**		**0.4471**	**0.4471**		**1,992.8344**	**1,992.8344**	**0.6123**		**2,008.1410**

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	0.1051	0.0777	0.8689	2.2700e-003	0.2300	1.7900e-003	0.2318	0.0610	1.6500e-003	0.0627		225.6870	225.6870	7.9800e-003		225.8864

Total	0.1051	0.0777	0.8689	2.2700e-003	0.2300	1.7900e-003	0.2318	0.0610	1.6500e-003	0.0627		225.6870	225.6870	7.9800e-003		225.8864

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	0.4690	9.4048	12.4314	0.0211		0.4576	0.4576		0.4576	0.4576	0.0000	1,894.2072	1,894.2072	0.6020		1,909.2578
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.4690**	**9.4048**	**12.4314**	**0.0211**		**0.4576**	**0.4576**		**0.4576**	**0.4576**	**0.0000**	**1,894.2072**	**1,894.2072**	**0.6020**		**1,909.2578**

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	0.1051	0.0777	0.8689	2.2700e-003	0.2300	1.7900e-003	0.2318	0.0610	1.6500e-003	0.0627		225.6870	225.6870	7.9800e-003		225.8864
Total	**0.1051**	**0.0777**	**0.8689**	**2.2700e-003**	**0.2300**	**1.7900e-003**	**0.2318**	**0.0610**	**1.6500e-003**	**0.0627**		**225.6870**	**225.6870**	**7.9800e-003**		**225.8864**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

Category	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
	lb/day										lb/day					
Archit. Coating	48.9627					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.5918	6.0697	5.9257	0.0107		0.2617	0.2617		0.2490	0.2490		1,005.4080	1,005.4080	0.2343		1,011.2650
Total	**49.5545**	**6.0697**	**5.9257**	**0.0107**		**0.2617**	**0.2617**		**0.2490**	**0.2490**		**1,005.4080**	**1,005.4080**	**0.2343**		**1,011.2650**

Unmitigated Construction Off-Site

Category	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
	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	0.5656	0.4340	4.7546	0.0118	1.1501	9.2800e-003	1.1594	0.3051	8.5600e-003	0.3136		1,169.6660	1,169.6660	0.0446		1,170.7811
Total	**0.5656**	**0.4340**	**4.7546**	**0.0118**	**1.1501**	**9.2800e-003**	**1.1594**	**0.3051**	**8.5600e-003**	**0.3136**		**1,169.6660**	**1,169.6660**	**0.0446**		**1,170.7811**

Mitigated Construction On-Site

Category	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
	lb/day										lb/day					

Archit. Coating	48.9627					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2173	4.4247	6.6630	0.0107		0.1532	0.1532		0.1532	0.1532	0.0000	1,005.4080	1,005.4080	0.2343		1,011.2649
Total	**49.1800**	**4.4247**	**6.6630**	**0.0107**		**0.1532**	**0.1532**		**0.1532**	**0.1532**	**0.0000**	**1,005.4080**	**1,005.4080**	**0.2343**		**1,011.2649**

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	0.5656	0.4340	4.7546	0.0118	1.1501	9.2800e-003	1.1594	0.3051	8.5600e-003	0.3136		1,169.6660	1,169.6660	0.0446		1,170.7811
Total	**0.5656**	**0.4340**	**4.7546**	**0.0118**	**1.1501**	**9.2800e-003**	**1.1594**	**0.3051**	**8.5600e-003**	**0.3136**		**1,169.6660**	**1,169.6660**	**0.0446**		**1,170.7811**

3.6 Architectural Coating - 2022

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	48.9627					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.5478	5.4933	5.8888	0.0107		0.2304	0.2304		0.2193	0.2193		1,005.2987	1,005.2987	0.2332		1,011.1282
Total	**49.5105**	**5.4933**	**5.8888**	**0.0107**		**0.2304**	**0.2304**		**0.2193**	**0.2193**		**1,005.2987**	**1,005.2987**	**0.2332**		**1,011.1282**

Unmitigated Construction Off-Site

Category	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
	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	0.5253	0.3887	4.3445	0.0113	1.1501	8.9600e-003	1.1590	0.3051	8.2600e-003	0.3133		1,128.4350	1,128.4350	0.0399		1,129.4322
Total	**0.5253**	**0.3887**	**4.3445**	**0.0113**	**1.1501**	**8.9600e-003**	**1.1590**	**0.3051**	**8.2600e-003**	**0.3133**		**1,128.4350**	**1,128.4350**	**0.0399**		**1,129.4322**

Mitigated Construction On-Site

Category	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
	lb/day										lb/day					
Archit. Coating	48.9627					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2173	4.4247	6.6630	0.0107		0.1532	0.1532		0.1532	0.1532	0.0000	1,005.2987	1,005.2987	0.2332		1,011.1282
Total	**49.1800**	**4.4247**	**6.6630**	**0.0107**		**0.1532**	**0.1532**		**0.1532**	**0.1532**	**0.0000**	**1,005.2987**	**1,005.2987**	**0.2332**		**1,011.1282**

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	0.5253	0.3887	4.3445	0.0113	1.1501	8.9600e-003	1.1590	0.3051	8.2600e-003	0.3133		1,128.4350	1,128.4350	0.0399		1,129.4322
Total	**0.5253**	**0.3887**	**4.3445**	**0.0113**	**1.1501**	**8.9600e-003**	**1.1590**	**0.3051**	**8.2600e-003**	**0.3133**		**1,128.4350**	**1,128.4350**	**0.0399**		**1,129.4322**

UCSC Student Housing Heller Demolition

Monterey Bay Unified APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	871.00	Dwelling Unit	13.00	871,000.00	2491

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.8	**Precipitation Freq (Days)**	53
Climate Zone	5			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 Rate

Land Use - for Construciton demolition

Construction Phase - Demolition only

Off-road Equipment - Based on construciton equipment list

Demolition - Assume 199 units @1200sf = 238,800sf

Construction Off-road Equipment Mitigation - Tier 4i portable/Tier 3 mobile and BMPs

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	20.00	80.00
tblConstructionPhase	PhaseEndDate	8/28/2019	11/20/2019
tblLandUse	LotAcreage	22.92	13.00
tblOffRoadEquipment	LoadFactor	0.36	0.36
tblOffRoadEquipment	LoadFactor	0.46	0.46
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Signal Boards
tblOffRoadEquipment	OffRoadEquipmentType		Sweepers/Scrubbers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	UsageHours	8.00	4.80
tblProjectCharacteristics	CO2IntensityFactor	641.35	290

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					

2019	0.0561	0.6668	0.4181	1.2600e-003	0.1347	0.0229	0.1576	0.0222	0.0216	0.0438	0.0000	114.8555	114.8555	0.0194	0.0000	115.3405
Maximum	**0.0561**	**0.6668**	**0.4181**	**1.2600e-003**	**0.1347**	**0.0229**	**0.1576**	**0.0222**	**0.0216**	**0.0438**	**0.0000**	**114.8555**	**114.8555**	**0.0194**	**0.0000**	**115.3405**

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					
2019	0.0397	0.6112	0.4568	1.2600e-003	0.0419	0.0162	0.0581	8.1400e-003	0.0155	0.0236	0.0000	114.8555	114.8555	0.0194	0.0000	115.3404
Maximum	**0.0397**	**0.6112**	**0.4568**	**1.2600e-003**	**0.0419**	**0.0162**	**0.0581**	**8.1400e-003**	**0.0155**	**0.0236**	**0.0000**	**114.8555**	**114.8555**	**0.0194**	**0.0000**	**115.3404**

	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**	**N20**	**CO2e**
Percent Reduction	**29.21**	**8.34**	**-9.25**	**0.00**	**68.90**	**29.40**	**63.16**	**63.33**	**28.14**	**45.99**	**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	**8-1-2019**	**9-30-2019**	0.3917	0.3525
		Highest	0.3917	0.3525

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	8/1/2019	11/20/2019	5	80	4 months = 80 days

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Generator Sets	1	4.80	84	0.74
Demolition	Excavators	2	4.80	158	0.38
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition	Rubber Tired Loaders	2	4.80	203	0.36
Demolition	Signal Boards	1	8.00	6	0.82
Demolition	Sweepers/Scrubbers	1	2.00	64	0.46
Demolition	Rubber Tired Dozers	0	8.00	247	0.40

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	7	18.00	0.00	1,086.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2019

Unmitigated Construction On-Site

Category	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
	tons/yr										MT/yr					
Fugitive Dust					0.1198	0.0000	0.1198	0.0181	0.0000	0.0181	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0475	0.4911	0.3588	7.6000e-004		0.0220	0.0220		0.0207	0.0207	0.0000	66.9529	66.9529	0.0174	0.0000	67.3872
Total	**0.0475**	**0.4911**	**0.3588**	**7.6000e-004**	**0.1198**	**0.0220**	**0.1417**	**0.0181**	**0.0207**	**0.0388**	**0.0000**	**66.9529**	**66.9529**	**0.0174**	**0.0000**	**67.3872**

Unmitigated Construction Off-Site

Category	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
	tons/yr										MT/yr					
Hauling	5.1300e-003	0.1724	0.0305	4.4000e-004	9.2300e-003	8.6000e-004	0.0101	2.5400e-003	8.2000e-004	3.3500e-003	0.0000	42.4183	42.4183	1.7700e-003	0.0000	42.4625
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	3.4500e-003	3.2300e-003	0.0288	6.0000e-005	5.7300e-003	5.0000e-005	5.7800e-003	1.5200e-003	5.0000e-005	1.5700e-003	0.0000	5.4844	5.4844	2.6000e-004	0.0000	5.4908
Total	**8.5800e-003**	**0.1757**	**0.0593**	**5.0000e-004**	**0.0150**	**9.1000e-004**	**0.0159**	**4.0600e-003**	**8.7000e-004**	**4.9200e-003**	**0.0000**	**47.9026**	**47.9026**	**2.0300e-003**	**0.0000**	**47.9533**

Mitigated Construction On-Site

Category	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
	tons/yr										MT/yr					

Category	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
Fugitive Dust					0.0270	0.0000	0.0270	4.0800e-003	0.0000	4.0800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0311	0.4355	0.3975	7.6000e-004		0.0153	0.0153		0.0146	0.0146	0.0000	66.9529	66.9529	0.0174	0.0000	67.3871
Total	**0.0311**	**0.4355**	**0.3975**	**7.6000e-004**	**0.0270**	**0.0153**	**0.0422**	**4.0800e-003**	**0.0146**	**0.0187**	**0.0000**	**66.9529**	**66.9529**	**0.0174**	**0.0000**	**67.3871**

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	5.1300e-003	0.1724	0.0305	4.4000e-004	9.2300e-003	8.6000e-004	0.0101	2.5400e-003	8.2000e-004	3.3500e-003	0.0000	42.4183	42.4183	1.7700e-003	0.0000	42.4625
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	3.4500e-003	3.2300e-003	0.0288	6.0000e-005	5.7300e-003	5.0000e-005	5.7800e-003	1.5200e-003	5.0000e-005	1.5700e-003	0.0000	5.4844	5.4844	2.6000e-004	0.0000	5.4908
Total	**8.5800e-003**	**0.1757**	**0.0593**	**5.0000e-004**	**0.0150**	**9.1000e-004**	**0.0159**	**4.0600e-003**	**8.7000e-004**	**4.9200e-003**	**0.0000**	**47.9026**	**47.9026**	**2.0300e-003**	**0.0000**	**47.9533**

UCSC Student Housing Heller Demolition

Monterey Bay Unified APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	871.00	Dwelling Unit	13.00	871,000.00	2491

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.8 **Precipitation Freq (Days)** 53

Climate Zone 5 **Operational Year** 2020

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 290 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2020 Rate

Land Use - for Construciton demolition

Construction Phase - Demolition only

Off-road Equipment - Based on construciton equipment list

Demolition - Assume 199 units @1200sf = 238,800sf

Construction Off-road Equipment Mitigation - Tier 4i portable/Tier 3 mobile and BMPs

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	20.00	80.00
tblConstructionPhase	PhaseEndDate	8/28/2019	11/20/2019
tblLandUse	LotAcreage	22.92	13.00
tblOffRoadEquipment	LoadFactor	0.36	0.36
tblOffRoadEquipment	LoadFactor	0.46	0.46
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Signal Boards
tblOffRoadEquipment	OffRoadEquipmentType		Sweepers/Scrubbers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	UsageHours	8.00	4.80
tblProjectCharacteristics	CO2IntensityFactor	641.35	290

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					

2019	1.4013	16.5776	10.4523	0.0318	3.3790	0.5721	3.9511	0.5576	0.5390	1.0967	0.0000	3,184.4675	3,184.4675	0.5330	0.0000	3,197.7912
Maximum	**1.4013**	**16.5776**	**10.4523**	**0.0318**	**3.3790**	**0.5721**	**3.9511**	**0.5576**	**0.5390**	**1.0967**	**0.0000**	**3,184.4675**	**3,184.4675**	**0.5330**	**0.0000**	**3,197.7912**

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					
2019	0.9916	15.1870	11.4193	0.0318	1.0587	0.4038	1.4626	0.2062	0.3872	0.5935	0.0000	3,184.4675	3,184.4675	0.5330	0.0000	3,197.7912
Maximum	**0.9916**	**15.1870**	**11.4193**	**0.0318**	**1.0587**	**0.4038**	**1.4626**	**0.2062**	**0.3872**	**0.5935**	**0.0000**	**3,184.4675**	**3,184.4675**	**0.5330**	**0.0000**	**3,197.7912**

	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**	**N20**	**CO2e**
Percent Reduction	**29.23**	**8.39**	**-9.25**	**0.00**	**68.67**	**29.41**	**62.98**	**63.01**	**28.17**	**45.89**	**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	Demolition	Demolition	8/1/2019	11/20/2019	5	80	4 months = 80 days

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Generator Sets	1	4.80	84	0.74
Demolition	Excavators	2	4.80	158	0.38
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Demolition	Rubber Tired Loaders	2	4.80	203	0.36
Demolition	Signal Boards	1	8.00	6	0.82
Demolition	Sweepers/Scrubbers	1	2.00	64	0.46
Demolition	Rubber Tired Dozers	0	8.00	247	0.40

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	7	18.00	0.00	1,086.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2019

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					2.9939	0.0000	2.9939	0.4534	0.0000	0.4534			0.0000			0.0000
Off-Road	1.1882	12.2786	8.9699	0.0190		0.5496	0.5496		0.5176	0.5176		1,845.0745	1,845.0745	0.4787		1,857.0416
Total	**1.1882**	**12.2786**	**8.9699**	**0.0190**	**2.9939**	**0.5496**	**3.5435**	**0.4534**	**0.5176**	**0.9710**		**1,845.0745**	**1,845.0745**	**0.4787**		**1,857.0416**

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	0.1265	4.2282	0.7302	0.0112	0.2372	0.0212	0.2584	0.0650	0.0203	0.0853		1,179.3311	1,179.3311	0.0469		1,180.5036
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	0.0866	0.0708	0.7523	1.6100e-003	0.1479	1.2800e-003	0.1491	0.0392	1.1800e-003	0.0404		160.0619	160.0619	7.3600e-003		160.2460
Total	**0.2131**	**4.2990**	**1.4825**	**0.0128**	**0.3851**	**0.0224**	**0.4075**	**0.1042**	**0.0214**	**0.1257**		**1,339.3930**	**1,339.3930**	**0.0543**		**1,340.7496**

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					0.6736	0.0000	0.6736	0.1020	0.0000	0.1020			0.0000			0.0000
Off-Road	0.7785	10.8880	9.9369	0.0190		0.3814	0.3814		0.3658	0.3658	0.0000	1,845.0745	1,845.0745	0.4787		1,857.0416

	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
Total	**0.7785**	**10.8880**	**9.9369**	**0.0190**	**0.6736**	**0.3814**	**1.0550**	**0.1020**	**0.3658**	**0.4678**	**0.0000**	**1,845.0745**	**1,845.0745**	**0.4787**		**1,857.0416**

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	0.1265	4.2282	0.7302	0.0112	0.2372	0.0212	0.2584	0.0650	0.0203	0.0853		1,179.3311	1,179.3311	0.0469		1,180.5036
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	0.0866	0.0708	0.7523	1.6100e-003	0.1479	1.2800e-003	0.1491	0.0392	1.1800e-003	0.0404		160.0619	160.0619	7.3600e-003		160.2460
Total	**0.2131**	**4.2990**	**1.4825**	**0.0128**	**0.3851**	**0.0224**	**0.4075**	**0.1042**	**0.0214**	**0.1257**		**1,339.3930**	**1,339.3930**	**0.0543**		**1,340.7496**

UCSC Student Housing Heller Site - OPERATION

Monterey Bay Unified APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	3.50	1000sqft	0.00	3,500.00	0
Parking Lot	414.00	Space	0.00	165,600.00	0
Apartments Low Rise	146.00	Dwelling Unit	9.13	67,932.00	418
Apartments Mid Rise	725.00	Dwelling Unit	19.08	900,779.00	2074

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.8	**Precipitation Freq (Days)**	53
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Using PG&E 2020 rate

Land Use - Based on project description. Wastewater added as Industrial use. Sf total = 968,711

Construction Phase - Based on durations provided and construction schedule

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on provided list

Trips and VMT -

Demolition -

Grading - Set to default acreage and used max.import/export quantities

Energy Use -

Water And Wastewater - Wastewater treatment, no septic or lagoons. 31,200,000 gallons potable water (2,187,938/29,012,062)

Solid Waste - Solidwate projection similar to project description

Construction Off-road Equipment Mitigation - Tier 4i portable/Tier 3 mobile and BMPs for fugitive dust

Mobile Land Use Mitigation -

Energy Mitigation -

Water Mitigation -

Stationary Sources - Emergency Generators and Fire Pumps - Assume up to 50 hours/generator per year

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	20.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	14.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblGrading	MaterialImported	0.00	40,000.00
tblLandUse	LandUseSquareFeet	146,000.00	67,932.00
tblLandUse	LandUseSquareFeet	725,000.00	900,779.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	3.73	0.00
tblOffRoadEquipment	HorsePower	203.00	247.00
tblOffRoadEquipment	LoadFactor	0.36	0.40
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	UsageHours	6.00	1.20
tblOffRoadEquipment	UsageHours	7.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	3.20
tblOffRoadEquipment	UsageHours	8.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	536.00
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	335.00
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	241.00
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	40.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	0.25
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	0.25
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	0.25
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	0.25
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	2.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	2.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	2.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	2.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	2.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	2.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	2.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00

tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	9,512,487.74	2,187,938.00
tblWater	IndoorWaterUseRate	47,236,668.58	29,012,062.00
tblWater	OutdoorWaterUseRate	5,997,003.14	0.00
tblWater	OutdoorWaterUseRate	29,779,638.88	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	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					
Area	4.6918	0.1038	8.9973	4.7000e-004		0.0497	0.0497		0.0497	0.0497	0.0000	14.6828	14.6828	0.0142	0.0000	15.0374
Energy	0.0506	0.4328	0.1859	2.7600e-003		0.0350	0.0350		0.0350	0.0350	0.0000	995.6563	995.6563	0.0591	0.0194	1,002.9201
Mobile	2.2609	12.0889	26.6398	0.0809	6.1515	0.0808	6.2323	1.6520	0.0758	1.7279	0.0000	7,434.3346	7,434.3346	0.3838	0.0000	7,443.9306
Stationary	0.0173	1.4900e-003	0.0451	1.0000e-005		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004	0.0000	1.0041	1.0041	2.1000e-003	0.0000	1.0566

Category	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
Waste						0.0000	0.0000		0.0000	0.0000	82.2113	0.0000	82.2113	4.8586	0.0000	203.6751
Water						0.0000	0.0000		0.0000	0.0000	11.3250	22.7834	34.1084	0.0413	0.0251	42.6195
Total	**7.0206**	**12.6269**	**35.8681**	**0.0842**	**6.1515**	**0.1656**	**6.3171**	**1.6520**	**0.1606**	**1.8126**	**93.5363**	**8,468.4611**	**8,561.9974**	**5.3590**	**0.0445**	**8,709.2392**

Mitigated Operational

	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					
Area	4.6918	0.1038	8.9973	4.7000e-004		0.0497	0.0497		0.0497	0.0497	0.0000	14.6828	14.6828	0.0142	0.0000	15.0374
Energy	0.0506	0.4328	0.1859	2.7600e-003		0.0350	0.0350		0.0350	0.0350	0.0000	958.8557	958.8557	0.0554	0.0187	965.8006
Mobile	2.2609	12.0889	26.6398	0.0809	6.1515	0.0808	6.2323	1.6520	0.0758	1.7279	0.0000	7,434.3346	7,434.3346	0.3838	0.0000	7,443.9306
Stationary	0.0173	1.4900e-003	0.0451	1.0000e-005		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004	0.0000	1.0041	1.0041	2.1000e-003	0.0000	1.0566
Waste						0.0000	0.0000		0.0000	0.0000	82.2113	0.0000	82.2113	4.8586	0.0000	203.6751
Water						0.0000	0.0000		0.0000	0.0000	8.6976	17.4977	26.1952	0.0317	0.0193	32.7317
Total	**7.0206**	**12.6269**	**35.8681**	**0.0842**	**6.1515**	**0.1656**	**6.3171**	**1.6520**	**0.1606**	**1.8126**	**90.9089**	**8,426.3748**	**8,517.2837**	**5.3458**	**0.0379**	**8,662.2321**

	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**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**2.81**	**0.50**	**0.52**	**0.25**	**14.78**	**0.54**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	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					
Mitigated	2.2609	12.0889	26.6398	0.0809	6.1515	0.0808	6.2323	1.6520	0.0758	1.7279	0.0000	7,434.3346	7,434.3346	0.3838	0.0000	7,443.9306
Unmitigated	2.2609	12.0889	26.6398	0.0809	6.1515	0.0808	6.2323	1.6520	0.0758	1.7279	0.0000	7,434.3346	7,434.3346	0.3838	0.0000	7,443.9306

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	962.14	1,045.36	886.22	2,774,823	2,774,823
Apartments Mid Rise	4,821.25	4,632.75	4248.50	13,576,189	13,576,189
General Heavy Industry	5.25	5.25	5.25	15,327	15,327
Parking Lot	0.00	0.00	0.00		
Total	5,788.64	5,683.36	5,139.97	16,366,339	16,366,339

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	44.00	18.80	37.20	86	11	3
Apartments Mid Rise	10.80	7.30	7.50	44.00	18.80	37.20	86	11	3
General Heavy Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.543525	0.028472	0.201539	0.126188	0.021864	0.005301	0.018669	0.039782	0.003072	0.002565	0.007028	0.001098	0.000897
Apartments Mid Rise	0.543525	0.028472	0.201539	0.126188	0.021864	0.005301	0.018669	0.039782	0.003072	0.002565	0.007028	0.001098	0.000897

General Heavy Industry	0.543525	0.028472	0.201539	0.126188	0.021864	0.005301	0.018669	0.039782	0.003072	0.002565	0.007028	0.001098	0.000897
Parking Lot	0.543525	0.028472	0.201539	0.126188	0.021864	0.005301	0.018669	0.039782	0.003072	0.002565	0.007028	0.001098	0.000897

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	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					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	457.9182	457.9182	0.0458	9.4700e-003	461.8863
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	494.7188	494.7188	0.0495	0.0102	499.0058
NaturalGas Mitigated	0.0506	0.4328	0.1859	2.7600e-003		0.0350	0.0350		0.0350	0.0350	0.0000	500.9375	500.9375	9.6000e-003	9.1800e-003	503.9143
NaturalGas Unmitigated	0.0506	0.4328	0.1859	2.7600e-003		0.0350	0.0350		0.0350	0.0350	0.0000	500.9375	500.9375	9.6000e-003	9.1800e-003	503.9143

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	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
Land Use	kBTU/yr	tons/yr										MT/yr					

Apartments Low Rise	2.97103e+006	0.0160	0.1369	0.0583	8.7000e-004		0.0111	0.0111		0.0111	0.0111	0.0000	158.5453	158.5453	3.0400e-003	2.9100e-003	159.4875
Apartments Mid Rise	6.32956e+006	0.0341	0.2917	0.1241	1.8600e-003		0.0236	0.0236		0.0236	0.0236	0.0000	337.7695	337.7695	6.4700e-003	6.1900e-003	339.7767
General Heavy Industry	86625	4.7000e-004	4.2500e-003	3.5700e-003	3.0000e-005		3.2000e-004	3.2000e-004		3.2000e-004	3.2000e-004	0.0000	4.6226	4.6226	9.0000e-005	8.0000e-005	4.6501
Parking Lot	0	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
Total		**0.0506**	**0.4328**	**0.1859**	**2.7600e-003**		**0.0350**	**0.0350**		**0.0350**	**0.0350**	**0.0000**	**500.9375**	**500.9375**	**9.6000e-003**	**9.1800e-003**	**503.9143**

Mitigated

	NaturalGas Use	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
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.97103e+006	0.0160	0.1369	0.0583	8.7000e-004		0.0111	0.0111		0.0111	0.0111	0.0000	158.5453	158.5453	3.0400e-003	2.9100e-003	159.4875
Apartments Mid Rise	6.32956e+006	0.0341	0.2917	0.1241	1.8600e-003		0.0236	0.0236		0.0236	0.0236	0.0000	337.7695	337.7695	6.4700e-003	6.1900e-003	339.7767
General Heavy Industry	86625	4.7000e-004	4.2500e-003	3.5700e-003	3.0000e-005		3.2000e-004	3.2000e-004		3.2000e-004	3.2000e-004	0.0000	4.6226	4.6226	9.0000e-005	8.0000e-005	4.6501
Parking Lot	0	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
Total		**0.0506**	**0.4328**	**0.1859**	**2.7600e-003**		**0.0350**	**0.0350**		**0.0350**	**0.0350**	**0.0000**	**500.9375**	**500.9375**	**9.6000e-003**	**9.1800e-003**	**503.9143**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	615562	80.9722	8.1000e-003	1.6800e-003	81.6738

Apartments Mid Rise	3.06094e+006	402.6419	0.0403	8.3300e-003	406.1310
General Heavy Industry	26460	3.4806	3.5000e-004	7.0000e-005	3.5108
Parking Lot	57960	7.6242	7.6000e-004	1.6000e-004	7.6902
Total		**494.7188**	**0.0495**	**0.0102**	**499.0058**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	582435	76.6145	7.6600e-003	1.5900e-003	77.2784
Apartments Mid Rise	2.83347e+006	372.7192	0.0373	7.7100e-003	375.9490
General Heavy Industry	23529.8	3.0952	3.1000e-004	6.0000e-005	3.1220
Parking Lot	41731.2	5.4894	5.5000e-004	1.1000e-004	5.5370
Total		**457.9182**	**0.0458**	**9.4700e-003**	**461.8863**

6.0 Area Detail

6.1 Mitigation Measures Area

	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					
Mitigated	4.6918	0.1038	8.9973	4.7000e-004		0.0497	0.0497		0.0497	0.0497	0.0000	14.6828	14.6828	0.0142	0.0000	15.0374
Unmitigated	4.6918	0.1038	8.9973	4.7000e-004		0.0497	0.0497		0.0497	0.0497	0.0000	14.6828	14.6828	0.0142	0.0000	15.0374

6.2 Area by SubCategory

Unmitigated

	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
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.6120					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.8077					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	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
Landscaping	0.2721	0.1038	8.9973	4.7000e-004		0.0497	0.0497		0.0497	0.0497	0.0000	14.6828	14.6828	0.0142	0.0000	15.0374
Total	**4.6918**	**0.1038**	**8.9973**	**4.7000e-004**		**0.0497**	**0.0497**		**0.0497**	**0.0497**	**0.0000**	**14.6828**	**14.6828**	**0.0142**	**0.0000**	**15.0374**

Mitigated

	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
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.6120					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.8077					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Hearth	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
Landscaping	0.2721	0.1038	8.9973	4.7000e-004		0.0497	0.0497		0.0497	0.0497	0.0000	14.6828	14.6828	0.0142	0.0000	15.0374
Total	**4.6918**	**0.1038**	**8.9973**	**4.7000e-004**		**0.0497**	**0.0497**		**0.0497**	**0.0497**	**0.0000**	**14.6828**	**14.6828**	**0.0142**	**0.0000**	**15.0374**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	26.1952	0.0317	0.0193	32.7317
Unmitigated	34.1084	0.0413	0.0251	42.6195

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e

Land Use	Mgal	MT/yr			
Apartments Low Rise	2.18794 / 0	2.3314	2.8200e-003	1.7200e-003	2.9132
Apartments Mid Rise	29.0121 / 0	30.9145	0.0374	0.0228	38.6286
General Heavy Industry	0.809375 / 0	0.8625	1.0400e-003	6.3000e-004	1.0777
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**34.1084**	**0.0413**	**0.0251**	**42.6195**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	1.68034 / 0	1.7905	2.1700e-003	1.3200e-003	2.2373
Apartments Mid Rise	22.2813 / 0	23.7423	0.0287	0.0175	29.6668
General Heavy Industry	0.6216 / 0	0.6624	8.0000e-004	4.9000e-004	0.8276
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**26.1952**	**0.0317**	**0.0193**	**32.7317**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	82.2113	4.8586	0.0000	203.6751
Unmitigated	82.2113	4.8586	0.0000	203.6751

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	67.16	13.6329	0.8057	0.0000	33.7749
Apartments Mid Rise	333.5	67.6975	4.0008	0.0000	167.7177
General Heavy Industry	4.34	0.8810	0.0521	0.0000	2.1826
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**82.2113**	**4.8586**	**0.0000**	**203.6751**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	67.16	13.6329	0.8057	0.0000	33.7749

Apartments Mid Rise	333.5	67.6975	4.0008	0.0000	167.7177
General Heavy Industry	4.34	0.8810	0.0521	0.0000	2.1826
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**82.2113**	**4.8586**	**0.0000**	**203.6751**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	2	0.25	2	536	0.73	CNG
Emergency Generator	1	0.25	2	335	0.73	CNG
Emergency Generator	2	0.25	2	241	0.73	CNG
Emergency Generator	2	0.25	2	40	0.73	CNG

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	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

Equipment Type	tons/yr										MT/yr					
Emergency Generator - CNG (0 - 500 HP)	7.8900e-003	7.6000e-004	0.0206	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.4574	0.4574	9.6000e-004	0.0000	0.4813
Emergency Generator - CNG (500 - 9999 HP)	9.4300e-003	7.3000e-004	0.0246	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.5467	0.5467	1.1400e-003	0.0000	0.5752
Total	**0.0173**	**1.4900e-003**	**0.0451**	**0.0000**		**9.0000e-005**	**9.0000e-005**		**9.0000e-005**	**9.0000e-005**	**0.0000**	**1.0041**	**1.0041**	**2.1000e-003**	**0.0000**	**1.0566**

11.0 Vegetation

UCSC Student Housing Heller Site - OPERATION

Monterey Bay Unified APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Heavy Industry	3.50	1000sqft	0.00	3,500.00	0
Parking Lot	414.00	Space	0.00	165,600.00	0
Apartments Low Rise	146.00	Dwelling Unit	9.13	67,932.00	418
Apartments Mid Rise	725.00	Dwelling Unit	19.08	900,779.00	2074

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.8	**Precipitation Freq (Days)**	53
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	290	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Using PG&E 2020 rate

Land Use - Based on project description. Wastewater added as Industrial use. Sf total = 968,711

Construction Phase - Based on durations provided and construction schedule

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on equipment list

Off-road Equipment - Based on provided list

Trips and VMT -

Demolition -

Grading - Set to default acreage and used max.import/export quantities

Energy Use -

Water And Wastewater - Wastewater treatment, no septic or lagoons. 31,200,000 gallons potable water (2,187,938/29,012,062)

Solid Waste - Solidwate projection similar to project description

Construction Off-road Equipment Mitigation - Tier 4i portable/Tier 3 mobile and BMPs for fugitive dust

Mobile Land Use Mitigation -

Energy Mitigation -

Water Mitigation -

Stationary Sources - Emergency Generators and Fire Pumps - Assume up to 50 hours/generator per year

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	20.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	14.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblGrading	MaterialImported	0.00	40,000.00
tblLandUse	LandUseSquareFeet	146,000.00	67,932.00
tblLandUse	LandUseSquareFeet	725,000.00	900,779.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	3.73	0.00
tblOffRoadEquipment	HorsePower	203.00	247.00
tblOffRoadEquipment	LoadFactor	0.36	0.40
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	UsageHours	6.00	1.20
tblOffRoadEquipment	UsageHours	7.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	3.20
tblOffRoadEquipment	UsageHours	8.00	3.20
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblOffRoadEquipment	UsageHours	8.00	5.60
tblProjectCharacteristics	CO2IntensityFactor	641.35	290
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	536.00
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	335.00
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	241.00
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	40.00
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	0.25
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	0.25
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	0.25
tblStationaryGeneratorsPumpsUse	HoursPerDay	0.00	0.25
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	2.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	2.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	2.00
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	2.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	2.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	1.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	2.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	2.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00

tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	9,512,487.74	2,187,938.00
tblWater	IndoorWaterUseRate	47,236,668.58	29,012,062.00
tblWater	OutdoorWaterUseRate	5,997,003.14	0.00
tblWater	OutdoorWaterUseRate	29,779,638.88	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	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					
Area	26.3943	0.8300	71.9787	3.8000e-003		0.3976	0.3976		0.3976	0.3976	0.0000	129.4805	129.4805	0.1251	0.0000	132.6072
Energy	0.2774	2.3715	1.0188	0.0151		0.1916	0.1916		0.1916	0.1916		3,025.6934	3,025.6934	0.0580	0.0555	3,043.6736
Mobile	13.7753	66.2313	153.7124	0.4803	36.0507	0.4567	36.5074	9.6559	0.4285	10.0844		48,620.2377	48,620.2377	2.4042		48,680.3420
Stationary	4.3308	0.3716	11.2796	1.5100e-003		0.0239	0.0239		0.0239	0.0239		276.6984	276.6984	0.5786		291.1622

Total	**44.7778**	**69.8044**	**237.9894**	**0.5008**	**36.0507**	**1.0699**	**37.1206**	**9.6559**	**1.0417**	**10.6976**	**0.0000**	**52,052.1100**	**52,052.1100**	**3.1658**	**0.0555**	**52,147.7850**

Mitigated Operational

	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					
Area	26.3943	0.8300	71.9787	3.8000e-003		0.3976	0.3976		0.3976	0.3976	0.0000	129.4805	129.4805	0.1251	0.0000	132.6072
Energy	0.2774	2.3715	1.0188	0.0151		0.1916	0.1916		0.1916	0.1916		3,025.6934	3,025.6934	0.0580	0.0555	3,043.6736
Mobile	13.7753	66.2313	153.7124	0.4803	36.0507	0.4567	36.5074	9.6559	0.4285	10.0844		48,620.2377	48,620.2377	2.4042		48,680.3420
Stationary	4.3308	0.3716	11.2796	1.5100e-003		0.0239	0.0239		0.0239	0.0239		276.6984	276.6984	0.5786		291.1622
Total	**44.7778**	**69.8044**	**237.9894**	**0.5008**	**36.0507**	**1.0699**	**37.1206**	**9.6559**	**1.0417**	**10.6976**	**0.0000**	**52,052.1100**	**52,052.1100**	**3.1658**	**0.0555**	**52,147.7850**

	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**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	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					
Mitigated	13.7753	66.2313	153.7124	0.4803	36.0507	0.4567	36.5074	9.6559	0.4285	10.0844		48,620.2377	48,620.2377	2.4042		48,680.3420
Unmitigated	13.7753	66.2313	153.7124	0.4803	36.0507	0.4567	36.5074	9.6559	0.4285	10.0844		48,620.2377	48,620.2377	2.4042		48,680.3420

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	962.14	1,045.36	886.22	2,774,823	2,774,823
Apartments Mid Rise	4,821.25	4,632.75	4248.50	13,576,189	13,576,189
General Heavy Industry	5.25	5.25	5.25	15,327	15,327
Parking Lot	0.00	0.00	0.00		
Total	5,788.64	5,683.36	5,139.97	16,366,339	16,366,339

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	44.00	18.80	37.20	86	11	3
Apartments Mid Rise	10.80	7.30	7.50	44.00	18.80	37.20	86	11	3
General Heavy Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.543525	0.028472	0.201539	0.126188	0.021864	0.005301	0.018669	0.039782	0.003072	0.002565	0.007028	0.001098	0.000897
Apartments Mid Rise	0.543525	0.028472	0.201539	0.126188	0.021864	0.005301	0.018669	0.039782	0.003072	0.002565	0.007028	0.001098	0.000897
General Heavy Industry	0.543525	0.028472	0.201539	0.126188	0.021864	0.005301	0.018669	0.039782	0.003072	0.002565	0.007028	0.001098	0.000897
Parking Lot	0.543525	0.028472	0.201539	0.126188	0.021864	0.005301	0.018669	0.039782	0.003072	0.002565	0.007028	0.001098	0.000897

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	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					
NaturalGas Mitigated	0.2774	2.3715	1.0188	0.0151		0.1916	0.1916		0.1916	0.1916		3,025.6934	3,025.6934	0.0580	0.0555	3,043.6736
NaturalGas Unmitigated	0.2774	2.3715	1.0188	0.0151		0.1916	0.1916		0.1916	0.1916		3,025.6934	3,025.6934	0.0580	0.0555	3,043.6736

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	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
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	8139.8	0.0878	0.7501	0.3192	4.7900e-003		0.0607	0.0607		0.0607	0.0607		957.6235	957.6235	0.0184	0.0176	963.3142
Apartments Mid Rise	17341.3	0.1870	1.5981	0.6801	0.0102		0.1292	0.1292		0.1292	0.1292		2,040.1488	2,040.1488	0.0391	0.0374	2,052.2724
General Heavy Industry	237.329	2.5600e-003	0.0233	0.0195	1.4000e-004		1.7700e-003	1.7700e-003		1.7700e-003	1.7700e-003		27.9210	27.9210	5.4000e-004	5.1000e-004	28.0870
Parking Lot	0	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
Total		**0.2774**	**2.3715**	**1.0188**	**0.0151**		**0.1916**	**0.1916**		**0.1916**	**0.1916**		**3,025.6934**	**3,025.6934**	**0.0580**	**0.0555**	**3,043.6736**

Mitigated

	NaturalGas Use	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
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	8.1398	0.0878	0.7501	0.3192	4.7900e-003		0.0607	0.0607		0.0607	0.0607		957.6235	957.6235	0.0184	0.0176	963.3142
Apartments Mid Rise	17.3413	0.1870	1.5981	0.6801	0.0102		0.1292	0.1292		0.1292	0.1292		2,040.1488	2,040.1488	0.0391	0.0374	2,052.2724
General Heavy Industry	0.237329	2.5600e-003	0.0233	0.0195	1.4000e-004		1.7700e-003	1.7700e-003		1.7700e-003	1.7700e-003		27.9210	27.9210	5.4000e-004	5.1000e-004	28.0870
Parking Lot	0	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
Total		**0.2774**	**2.3715**	**1.0188**	**0.0151**		**0.1916**	**0.1916**		**0.1916**	**0.1916**		**3,025.6934**	**3,025.6934**	**0.0580**	**0.0555**	**3,043.6736**

6.0 Area Detail

6.1 Mitigation Measures Area

	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					
Mitigated	26.3943	0.8300	71.9787	3.8000e-003		0.3976	0.3976		0.3976	0.3976	0.0000	129.4805	129.4805	0.1251	0.0000	132.6072
Unmitigated	26.3943	0.8300	71.9787	3.8000e-003		0.3976	0.3976		0.3976	0.3976	0.0000	129.4805	129.4805	0.1251	0.0000	132.6072

6.2 Area by SubCategory

Unmitigated

	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
SubCategory	lb/day										lb/day					
Architectural Coating	3.3536					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	20.8640					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	2.1767	0.8300	71.9787	3.8000e-003		0.3976	0.3976		0.3976	0.3976		129.4805	129.4805	0.1251		132.6072
Total	**26.3943**	**0.8300**	**71.9787**	**3.8000e-003**		**0.3976**	**0.3976**		**0.3976**	**0.3976**	**0.0000**	**129.4805**	**129.4805**	**0.1251**	**0.0000**	**132.6072**

Mitigated

	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
SubCategory	lb/day										lb/day					
Architectural Coating	3.3536					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	20.8640					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	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
Landscaping	2.1767	0.8300	71.9787	3.8000e-003		0.3976	0.3976		0.3976	0.3976		129.4805	129.4805	0.1251		132.6072
Total	**26.3943**	**0.8300**	**71.9787**	**3.8000e-003**		**0.3976**	**0.3976**		**0.3976**	**0.3976**	**0.0000**	**129.4805**	**129.4805**	**0.1251**	**0.0000**	**132.6072**

7.0 Water Detail

7.1 Mitigation Measures Water

Use Reclaimed Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	2	0.25	2	536	0.73	CNG
Emergency Generator	1	0.25	2	335	0.73	CNG
Emergency Generator	2	0.25	2	241	0.73	CNG
Emergency Generator	2	0.25	2	40	0.73	CNG

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/Mitigated

	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
Equipment Type	lb/day										lb/day					
Emergency Generator - CNG (0 - 500 HP)	1.9730	0.1900	5.1385	6.9000e-004		0.0109	0.0109		0.0109	0.0109		126.0531	126.0531	0.2636		132.6422
Emergency Generator - CNG (500 - 9999 HP)	2.3579	0.1816	6.1410	8.2000e-004		0.0130	0.0130		0.0130	0.0130		150.6453	150.6453	0.3150		158.5200
Total	**4.3308**	**0.3716**	**11.2796**	**1.5100e-003**		**0.0239**	**0.0239**		**0.0239**	**0.0239**		**276.6984**	**276.6984**	**0.5786**		**291.1622**

11.0 Vegetation

APPENDIX 4.3

Lists of Special-Status Species with Potential to Occur on or in the Vicinity of the Project Sites

Lists of Special-Status Species with Potential to Occur on or in the Vicinity of the Heller and Hagar sites

Table 1: Special-Status Species Evaluated for the Project

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
Plants			
Blasdale's bent grass *Agrostis blasdalei*	–/–/1B	Occurs in coastal bluff scrub, coastal dunes, and coastal prairie; sandy and gravelly soil. Elevation: 5-150 meters (m). Blooms: May-June.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Bent-flowered fiddleneck *Amsinckia lunaris*	–/–/1B	Occurs in coastal bluff scrub, cismontane woodland, valley and foothill grassland; openings. Elevation: 3-500 m. Blooms: March-June.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Santa Cruz (Anderson's) manzanita *Arctostaphylos andersonii*	–/–/1B	Occurs in open sites and edges in broadleafed upland forest, chaparral, and north coast coniferous forest; and redwood forest. Elevation: 60-760 m. Blooms: November-May.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Schreiber's manzanita *Arctostaphylos glutinosa*	–/–/1B	Occurs in closed-cone coniferous forest and chaparral; mudstone and diatomaceous shale outcrops. Elevation: 170-685 m. Blooms: November-April.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Ohlone manzanita *Arctostaphylos ohloneana*	–/–/1B	Occurs in chaparral, closed-cone pine forest; mudstone or shale outcrops. Elevation: Elevation range not available. Blooms: February-March.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Pajaro manzanita *Arctostaphylos pajaroensis*	–/–/1B	Occurs in sandy sites and sandstone outcrops in chaparral. Elevation: 30-760 m. Blooms: December-March.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Bonny Doon manzanita *Arctostaphylos silvicola*	–/–/1B	Occurs in chaparral, ponderosa pine forest, and lower montane coniferous forest; specifically associated with inland marine sands. Elevation: 120-390 m. Blooms: February-March.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
Marsh sandwort *Arenaria paludicola*	FE/CE/1B	Occurs in freshwater conditions in bogs, fens, marshes and swamps; sandy openings. Elevation: 3-170 m. Blooms: May-August.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Santa Cruz Mountains pussypaws *Calyptridium parryi* var. *hesseae*	–/–/3	Occurs in chaparral and cismontane woodland. Elevation: 700-1,100 m. Blooms: May-August.	Not observed during protocol-level surveys conducted at the Heller site. No suitable habitat present at the Hagar site.
Swamp harebell *Campanula californica*	–/–/1B	Occurs in bogs and fens, closed-cone coniferous forest, coastal prairie, meadows, marshes and swamps; freshwater. Elevation: 1-405 m. Blooms: June-October.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Bristly sedge *Carex comosa*	–/–/2B	Occurs in marshes and swamps, lake margins, valley and foothill grasslands. Elevation: 270-1,030 m. Blooms: May-September.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Deceiving sedge *Carex saliniformis*	–/–/1B	Occurs in coastal prairie, coastal scrub, meadows, seeps, marshes and swamps; mesic sites with coastal salt. Elevation: 3-230 m. Blooms: June-July.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Ben Lomond spineflower *Chorizanthe pungens* var. *hartwegiana*	FE/–/1B	Occurs in Zayante sandhill, maritime chaparral. Elevation: 90-350 m. Blooms: April-July.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Scott's Valley spineflower *Chorizanthe pungens* var. *hartwegii*	FE/–/1B	Occurs in grassland, sandstone outcrops. Elevation: 200-280 m. Blooms: April-July.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Robust spineflower *Chorizanthe robusta* var. *robusta*	FE/–/1B	Occurs in sandy or gravelly openings on terraces and bluffs in cismontane woodland, coastal dunes, and coastal scrub. Elevation: 3-300 m. Blooms: April-September.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
San Francisco (collinsia) blue eyed Mary *Collinsia multicolor*	–/–/1B	Occurs in closed-cone coniferous forest, coastal scrub and grassland on decomposed shale (mudstone) mixed with humus; in moist and shady areas and sometimes on serpentinite. Elevation: 30-250 m. Blooms: March-May.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Tear drop moss *Dacryophyllum falcifolium*	–/–/1B	Occurs on a variety of rock types (rock outcrops and walls) in shady areas in coast redwood and north coast coniferous forests. Elevation: 50-275 m. Blooms: N/A.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
California bottlebrush grass *Elymus californicus*	–/–/4	Occurs in cismontane woodland, North Coast coniferous forest, broad-leafed upland forest, riparian woodland. Elevation: 19-460 m. Blooms: May-August.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Ben Lomond buckwheat *Eriogonum nudum* var. *ducurrens*	–/–/1B	Occurs in ponderosa pine sandhills in Santa Cruz County in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 50-800 m. Blooms: June-October.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Santa Cruz wallflower *Erysimum teretifolium*	FE/CE/1B	Occurs on inland and marine sands in chaparral and lower montane coniferous forest; Ponderosa pine sandhills in Santa Cruz County. Elevation: 120-610 m. Blooms: March-July.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Minute pocket moss *Fissidens pauperculus*	–/–/1B	Occurs in coniferous forest along dry streambeds and stream banks. Elevation: Not applicable Blooms: Not applicable.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
San Francisco gumplant *Grindelia hirsutula* var. *maritima*	–/–/3	Occurs in coastal bluff scrub, coastal scrub, valley and foothill grassland, in sandy or serpentine soil. Elevation: 19-200 m. Blooms: June-September.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
Santa Cruz Cypress *Hesperocyparis abramsiana* var. *abramsiana*	FE/CE/1B	Occurs in closed-cone coniferous forest, chaparral, and lower montane coniferous forest; in sandstone or granitic substrates. Elevation: 280-1,800 m. Blooms: N/A.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Loma Prieta hoita *Hoita strobilina*	–/–/1B	Occurs in chaparral, cismontane woodland, and riparian woodland on mesic serpentine sites. Elevation: 30-860 m. Blooms: May-October.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Santa Cruz tarplant *Holocarpha macradenia*	FT/CE/1B	Occurs in sandy-clay soil in coastal prairie, coastal scrub, and in valley and foothill grassland. Elevation: 10-220 m. Blooms: June-October.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site. Species introduced within grazing exclosures in the East Meadow as part of a research project on campus (UCSC 2005).
Kellogg's horkelia *Horkelia cuneata* var. *sericea*	–/–/1B	Occurs in closed-cone coniferous forest, maritime chaparral, coastal scrub, dunes and coastal sandhills; sandy or gravelly openings. Elevation: 10-200 m. Blooms: April-September.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site. Recorded at an unknown location around vicinity of UCSC Natural Reserve along Empire Grade Road (CDFW 2017).
Point Reyes horkelia *Horkelia marinensis*	–/–/1B	Occurs in sandy flats and dunes near coast in grassland or scrub plant communities. Elevation: 5-30 m. Blooms: May-September.	Not observed during protocol-level surveys conducted at the Heller site in 2016. Could occur within the grasslands at the Hagar site. Known to occur within the campus at the Marshall Field (UCSC 2005).
Large flowered leptosiphon *Leptosiphon grandiflorus*	–/–/4	Occurs in coastal scrub, coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, valley and foothill grassland, usually in sandy soil. Elevation: 9-1,110 m. Blooms: April-August.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Smooth lessingia *Lessingia micradenia* var. *glabrata*	–/–/1B	Occurs in chaparral and cismontane woodland; serpentinite, roadsides. Elevation: 120-420 m. Blooms: July-November.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
Arcuate bush mallow *Malacothamnus arcuatus*	–/–/1B	Occurs in chaparral and coastal scrub in gravelly alluvium. Elevation: 15-355 m. Blooms: April-September.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Marsh microseris *Microseris paludosa*	–/–/1B	Occurs in moist grassland, openings in closed-cone coniferous forest and cismontane woodland, coastal scrub. Elevation: 5-300 m. Blooms: April-July.	Could occur at the Hagar site due to presence of suitable grassland habitat. Not observed during protocol-level surveys conducted at the Heller site in 2016. Known to occur in Marshall Field on the UCSC campus (CDFW 2017).
Elongate copper moss *Mielichhoferia elongata*	–/–/4	Occurs in cismontane woodland on metamorphic rock, usually vernally wet. Elevation: N/A. Blooms: N/A.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Northern curly-leaved monardella *Monardella sinuata* ssp. *nigrescens*	–/–/1B	Occurs in coastal scrub, coastal dunes, coniferous forest. Elevation: 8-180 m. Blooms: May-July.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Woodland woollythreads *Monolopia gracilens*	–/–/1B	Occurs in openings in broad-leafed upland forest, chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland; Serpentine Elevation: 100-1,200 m. Blooms: March-July.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Dudley's lousewort *Pedicularis dudleyi*	–/–/1B	Chaparral (maritime), cismontane woodland, north coast coniferous forest, valley and foothill grassland; in deep shade. Elevation: 60-900 m. Blooms: April-June.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Santa Cruz Mountains beardtongue *Penstemon rattanii* var. *kleei*	–/–/1B	Occurs in sandy shale slopes in chaparral and lower montane coniferous forests; sometimes in the transition zone between forest in chaparral; known from fewer than 10 occurrences. Elevation: 400-1,100 m. Blooms: May-June.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
White-rayed pentachaeta *Pentachaeta bellidiflora*	FE/CE/1B	Occurs in cismontane woodland, valley and foothill grassland; often in serpentine soils. Elevation: 35-620 m. Blooms: March-May.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
Monterey pine *Pinus radiata*	–/–/1B	Occurs in closed-cone coniferous forest and cismontane woodland; dry bluffs and slopes. Elevation: 25-185 m. Blooms: N/A.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
White-flowered rein orchid *Piperia candida*	–/–/1B	Occurs in coniferous forest, sometimes on serpentine; rocky outcrops. Elevation: 40-730 m. Blooms: May-September.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Choris's popcorn-flower *Plagiobothrys chorisianus* var. *chorisianus*	–/–/1B	Occurs in grassy and moist areas (ephemeral drainages) in chaparral, coastal prairie and coastal scrub. Elevation: 15-160 m. Blooms: March-June.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
San Francisco popcorn-flower *Plagiobothrys diffusus*	–/CE/1B	Occurs on grassy slopes with marine influence in coastal prairie and in valley and foothill grassland; known from fewer than 10 occurrences. Elevation: 60-360 m. Blooms: March-June.	Could occur at the Hagar site due to presence of suitable grassland habitat. Not observed during protocol-level surveys conducted at the Heller site in 2016.
Scotts Valley polygonum *Polygonum hickmanii*	FE/CE/1B	Occurs in valley and foothill grassland; vernally moist mudstone and sandstone outcrops; known from only two occurrences in Scotts Valley. Elevation: 210-250 m. Blooms: May-August.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site. Recorded within the Moore Creek greenbelt, approximately 0.8 mile from the Hagar site (CDFW 2017).
Maple-leaved checkerbloom *Sidalcea malachroides*	–/–/4	Occurs in broad-leafed upland forest, coastal prairie, coastal scrub, North Coast coniferous forest, often in disturbed places. Elevation: 8-1,200 m. Blooms: April-August.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
San Francisco campion *Silene verecunda* subsp. *verecunda*	–/–/1B	Occurs in coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland; sand, mudstone, shale or serpentine. Elevation: 30-645 m. Blooms: March-June.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
Santa Cruz microseris *Stebbinsoseris decipiens*	–/–/1B	Occurs in broad-leafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie and coastal scrub; open disturbed areas with sandstone, shale or serpentine derived soils. Elevation: 10-500 m. Blooms: April-May.	Not observed during protocol-level surveys conducted at the Heller site in 2016. No suitable habitat present at the Hagar site.
Santa Cruz clover *Trifolium buckwestiorum*	–/–/1B	Occurs in moist grassland, gravelly and marginal areas in coastal prairie, broad-leafed upland forest, and cismontane woodland. Elevation: 105-610 m. Blooms: April-October.	Could occur at the Hagar site. Not observed during protocol-level surveys conducted at the Heller site in 2016.
Invertebrates			
Ohlone tiger beetle *Cicindela ohlone*	FE/–	Occurs in poorly drained clay or sandy clay soil over bedrock of Santa Cruz mudstone within remnant native grasslands with California oatgrass (*Danthonia californica*) and purple needlegrass (*Stipa pulchra*) in Santa Cruz County.	Not observed during focused surveys conducted at the Porter Meadow within the Heller site utility corridor in 2016 (ECS 2016). Not likely to occur at the Hagar site due to the absence of suitable habitat. Known to occur at the UCSC campus near Marshall field and at the Pogonip City Park east of the Hagar site.
Mount Hermon june beetle *Polyphylla barbata*	FE/–	Occurs in Zayante sands near pine forest and chaparral habitats near Mount Hermon, Scotts Valley, and Ben Lomond in the Santa Cruz County.	Unlikely to occur. No suitable habitat with Zayante sands present at either site.
Santa Cruz rain beetle *Pleocoma conjungens conjungens*	Former Federal Species of Concern/–	Occurs in sandy soils, especially in sand parkland habitat. The Waddell Creek collection was in coastal sage scrub and redwood forest habitat. Known from Santa Cruz, Ben Lomond, Felton, Mt. Hermon, Scotts Valley, Redwood Glen, and Waddell Creek in Santa Cruz County.	Unlikely to occur at either site because of lack of suitable habitat.
San Francisco lacewing *Nothochrysa californica*	Former Federal Species of Concern/–	Occurs in riparian areas, oak woodlands, and coastal scrub habitats.	Unlikely to occur at either site because of lack of suitable habitat. Not known to occur in the County (USFWS 2017).

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
Smith's blue butterfly *Euphilotes enoptes smithi*	FE/–	Occurs in coastal dune, coastal scrub, chaparral, and grasslands where its host plants, seacliff buckwheat (*Eriogonum parvifolium*) and/or coast buckwheat (*Eriogonum latifolium*), are present.	Host plants, seacliff buckwheat and coast buckwheat, not observed during focused plant surveys conducted at the Heller site in 2016. No suitable habitat for host plants within the Hagar site.
Monarch butterfly *Danaus plexippus*	–/Sensitive Winter Roosting Sites	Winter roosts along the coast from northern Mendocino to Baja California, Mexico in wind-protected tree groves (eucalyptus, Monterey pine, cypress) with nectar and water sources nearby.	Marginal roost sites may be present in trees within the vicinity of the sites, but no suitable roosting habitat is present within either site. No known roost sites are present adjacent to the project sites; known to overwinter in trees along Limestone Lane, approximately 1,000 feet southeast of the Hagar site (CDFW 2017).
Zayante band-winged grasshopper *Trimerotropis infantilis*	FE/–	Restricted to the Zayante sand hills ecosystem. Found in sand parkland habitat on ridges and hills.	Unlikely to occur at either site due to lack of suitable habitat.
Santa Cruz telemid spider (*Telemid* sp.)	–/G1, G2, S1, S2	Known only from Empire Cave.	No suitable habitat present on the sites, but known to occur adjacent to the Heller site within Empire Cave.
Dolloff Cave spider *Meta dolloff*	–/G1, S1	Occurs in metamorphosed limestone cave subject to periodic flooding. Known from Empire Cave.	No suitable habitat present on the sites, but known to occur adjacent to the Heller site within Empire Cave.
Empire Cave pseudoscorpion *Fissilicreagris imperialis*	–/G1, S1	Known only from Empire Cave.	No suitable habitat present on the sites, but known to occur adjacent to the Heller site within Empire Cave.
Mackenzie's Cave amphipod *Stygobromus mackenziei*	–/G1, S1	Occurs in metamorphosed limestone cave subject to periodic flooding. Known only from Empire Cave.	No suitable habitat present on the sites, but known to occur adjacent to the Heller site within Empire Cave.
Amphibians			

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
California red-legged frog *Rana draytonii*	FT/SSC	Found in lowlands and foothills in or near permanent ponds and streams with dense, shrubby, or emergent riparian vegetation.	No suitable aquatic or breeding habitat present on the sites, but may disperse through the proposed utility corridor within the Porter Meadow adjacent to the Heller site. Heller site is mapped within designated critical habitat (USFWS 2010), but no suitable habitat present within the development footprint. May briefly disperse through the proposed utility corridor. Unlikely to occur at the Hagar site. No suitable aquatic, breeding or dispersal habitat present within the Hagar site and utility corridor. Hagar site is located outside designated critical habitat.
California giant salamander *Dicamptodon ensatus*	–/SSC	Occurs in wet coastal forests near streams and seeps from Mendocino County south to Monterey County and east to Napa County. Aquatic larvae found in cold, clear streams, occasionally in lakes and ponds and adults known from wet forests under rocks.	Known to occur in the forest habitat near the Heller site within Wilder Creek, Cave Gulch, and Empire Cave (CDFW 2017). No suitable habitat present at the Hagar site; therefore, unlikely to occur on the Hagar site.
Santa Cruz black salamander *Aneides niger*	–/SSC	Found under rocks, talus, and damp woody debris in mixed deciduous and coniferous woodlands and coastal grasslands.	May occur in forest habitat near the Heller site. No suitable habitat present within the Hagar site and development footprint within the Heller site. Recorded at the Quarry Amphitheater and vicinity, between Mclaughlin Drive and Steinhart Way at UCSC (CDFW 2017).
Santa Cruz long-toed salamander *Ambystoma macrodactylum croceum*	FE/–	Occurs in wet meadows near sea level; uses mammal burrows.	Unlikely to occur due to lack of suitable habitat conditions at either site.
Reptiles			
Western pond turtle *Emys marmorata*	–/SSC	Found in ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites and adjacent grasslands or other open habitat for egg-laying.	No suitable aquatic habitat present on or immediately adjacent to the sites. Observed approximately a half mile from the Heller site in the Arboretum Pond within the UCSC campus and in lower Moore Creek just south of UCSC (CDFW 2017).

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
Blainville's horned lizard *Phrynosoma blainvillii*	–/SSC	Found in open sunny habitats including grasslands, scrub, and open woodlands that support native ant populations.	Suitable habitat present in the grassland habitat within the Heller and Hagar sites, but has not been recorded near the sites (CDFW 2017).
Birds			
Marbled murrelet *Brachyramphus marmoratus*	FT/CE	Nests in old growth and mature coniferous forests near the coast	No known nesting documented on UC Santa Cruz campus; unlikely to nest in redwood forest adjacent to Heller site due to lack of mature redwoods with large lateral branches suitable for nesting platforms. No suitable nesting habitat present at or near the Hagar site.
White-tailed kite *Elanus leucurus*	–/CFP	Nests in shrubs and trees in open areas and forages in adjacent grasslands and agricultural land.	Suitable nesting habitat present in trees and large shrubs on and adjacent to the project sites and suitable foraging habitat present in grasslands on the sites. Two individual kites observed foraging over the Hagar site during LSA's December 2017 survey. Closest CNDDB nesting occurrence is approximately 0.4 mile north of the Heller site within the UC Santa Cruz Environmental Reserve Lands (CDFW 2017).
Northern harrier *Circus hudsonius*	–/SSC	Nests and forages in meadows, grasslands, open rangeland, and fresh or saltwater marshes.	Grasslands at the Heller and Hagar sites provide suitable nesting and foraging habitat. Observed foraging north of the Arboretum (Jones & Stokes 2004 as cited in UCSC 2005). No CNDDB records of birds nesting on the campus (CDFW 2017).
Golden eagle *Aquila chrysaetos*	–/CFP	Forages in rolling foothill or coast-range terrain, with open grassland and scattered large trees. Nests in large trees, on cliffs, and occasionally on power line poles.	May forage over grassland habitat on the sites. Observed foraging and perching in the grasslands east of Hagar Drive (Jones & Stokes 2004 as cited in UCSC 2005). High level of human disturbance most likely precludes nesting at UC Santa Cruz. No CNDDB records of birds nesting on the campus (CDFW 2017).

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
Bald eagle *Haliaeetus leucocephalus*	Delisted/CE; CFP	Nests and roosts in coniferous forests within 1 mile of a lake, a reservoir, a stream, or the ocean.	May briefly forage or fly over the sites. No CNDDB records of birds nesting on the campus (CDFW 2017).
American peregrine falcon *Falco peregrinus anatum*	Delisted/ Delisted; CFP	Forages in open country, mountains, and sea coasts. Nests on high cliffs, bridges, and buildings.	No suitable nesting habitat present; suitable foraging habitat present in grasslands at the sites. No CNDDB records of birds nesting on the campus (CDFW 2017).
Burrowing owl *Athene cunicularia*	–/SSC	Nests in burrows in grasslands and woodlands; often associated with ground squirrels. Will also nest in artificial structures (culverts, concrete debris piles, etc.).	May forage or winter in the grasslands on and adjacent to the sites, but nesting is rare within the County (Suddjian 2009). Historically nested in the East Meadow north of the Hagar site between the Hagar site and the east remote parking lot, but now over-winters annually, usually departing by the end of March (CDFW 2017). LSA observed a burrow with burrowing owl sign (i.e., white wash, pellet, feathers) in December 2017 at a ground squirrel burrow in the East Meadow just downhill of the east remote parking lot (LSA pers. obs.). No CNDDB records for the grasslands at the Porter Meadow near the Heller site (CDFW 2017).
Long-eared owl *Asio otus*	–/SSC	Occurs in woodlands and forests that are open or adjacent to grasslands, meadows, or shrublands.	Suitable nesting habitat present in redwood forest and California bay forest adjacent to Heller site, but species is rare in the County (Suddjian 2009; Shuford and Gardali 2008). May forage in grassland habitat on the sites. No CNDDB records of birds nesting on the campus (CDFW 2017).
Short-eared owl *Asio flammeus*	–/SSC	Occurs in salt- and freshwater marshes, grasslands, open treeless areas with low perches and dense vegetation for roosting and nesting.	May winter, migrate, or forage through the sites, but species not known to breed in the region (Suddjian 2009; Shuford and Gardali 2008). Known to winter/roost near the East Field (Ecosystems West 2001 as cited in UCSC 2005).

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
Vaux's swift *Chaetura vauxi*	–/SSC	Occurs in grasslands and agricultural fields; nests in large hollow trees near open water; forages in most habitats but prefers rivers and lakes.	Suitable foraging habitat present within grasslands on the sites and suitable nesting habitat may be present in forests and trees near the sites. No CNDDB records of birds nesting on the campus (CDFW 2017).
Black swift *Cypseloides niger*	–/SSC	Occurs in the coastal belt of Santa Cruz and Monterey Counties, in the central and southern Sierra Nevada, and in the San Bernardino and San Jacinto Mountains; breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea bluffs above the surf.	May forage over the sites, but no suitable nesting habitat present. Known to forage along the coast of Santa Cruz County off of Highway 1 in the vicinity of Wilder Ranch (LSA pers. obs.).
Willow flycatcher *Empidonax trailii*	FE/–	Occurs in riparian areas and large wet meadows with abundant willows. Usually found in riparian habitats during migration.	Rare spring and fall migrant in the County (Suddjian 2009). No CNDDB records of birds nesting on the campus (CDFW 2017).
Olive-sided flycatcher *Contopus cooperi*	–/SSC	Occurs in coniferous forests with open canopies.	Suitable nesting and foraging habitat present in redwood forest adjacent to Heller site. Not likely to occur near Hagar site due to lack of coniferous forest habitat. No CNDDB records of birds nesting on the campus (CDFW 2017).
Loggerhead shrike *Lanius ludovicianus*	–/SSC	Found in grasslands and open shrub or woodland communities. Nests in dense shrubs or trees and forages in scrub, open woodlands, grasslands, and croplands. Frequently uses fences, posts, and utility lines as hunting perches.	Suitable nesting and foraging habitat present at the sites. Fairly common in County in summer (Suddjian 2009). No CNDDB records of birds nesting on the campus (CDFW 2017).
Purple martin *Progne subis*	–/SSC	Occurs in woodlands; nests in tree snags and abandoned woodpecker cavities and human-made structures.	Suitable nesting habitat present, but species is rare in the County (Suddjian 2009). No CNDDB records of birds nesting on campus (CDFW 2017).
Bank swallow *Riparia riparia*	–/CT	Occurs in riparian habitat; nests in banks associated with streams, rivers, and lakes.	Potential nesting habitat present in streams adjacent to Heller and Hagar sites, but species is rare in the County (Suddjian 2009). No CNDDB records of birds nesting on the campus (CDFW 2017).

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
Yellow warbler *Dendroica petechia*	–/SSC	Nests in extensive willow riparian woodlands.	Suitable nesting habitat present near Heller site, but species is a rare breeder in the County (Suddjian 2009). May briefly occur near the Heller site during migration. No CNDDB records of birds nesting on the campus (CDFW 2017).
Yellow-breasted chat *Icteria virens*	–/SSC	Nests in dense riparian habitats dominated by willows, alders, Oregon ash, tall weeds, blackberry vines, and grapevines.	Suitable habitat may be present along creeks near the Heller site. Locally rare in summer and fall; a few breeding records have been recorded in the County (Suddjian 2009). Birds have been observed in Moore Creek (EcoSystems West 2002 as cited in UCSC 2005). No suitable habitat present near the Hagar site. No CNDDB records of birds nesting on the campus (CDFW 2017).
Grasshopper sparrow *Ammodramus savannarum*	–/SSC	Occurs in moderately open grasslands with scattered shrubs.	Suitable nesting and foraging habitat present at the Hagar site and in the Porter Meadow near the Heller site. Known to occur along Moore Creek and at the Pogonip City Park (UCSC 2005). No CNDDB records of birds nesting on the campus (CDFW 2017).
Tricolored blackbird *Agelaius tricolor*	–/SSC	Nests in dense vegetation near open water; forages in grasslands and agricultural fields.	No suitable nesting habitat present; may forage over grasslands on the sites. No CNDDB records of birds nesting on the campus (CDFW 2017).
Mammals			
Townsend's western big-eared bat *Corynorhinus townsendii townsendii*	–/SSC	Found in wooded areas with caves or old buildings for roost sites.	Could roost in old buildings and tree hollows adjacent to the sites and forage within the sites, but no suitable roosting or hibernating habitat present on the sites; unlikely to roost in caves near the Heller site due to high levels of human disturbance. Evidence of roosting observed in a tree hollow in Cave Gulch in 2001 and detected in Cave Gulch and at the intersection of North Fuel Break Road and Red Hill Road (EcoSystems West 2001 as cited in UCSC 2005).

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
Pallid bat *Antrozous pallidus*	–/SSC	Occupies a wide variety of habitats at low elevations. Most commonly found in open, dry habitats with rocky areas for roosting.	No suitable roosting habitat present at the sites, but may forage over the sites; potential roosting habitat present in abandoned historic buildings in the vicinity of the Hagar site.
Western mastiff bat *Eumops perotis californicus*	–/SSC	Roosts in crevices in cliff faces, tunnels, and high buildings.	May forage within the sites, but no suitable roosting habitat present. Could roost in old buildings in the vicinity of the Hagar site. No CNDDB occurrences recorded within 5 miles of the sites (CDFW 2017).
Western red bat *Lasiurus blossevillii*	-/SSC	Roosts in foliage primarily in riparian and wooded habitats.	May forage over the sites; suitable roosting habitat present in forest habitat on and/or adjacent to the sites. Detected in Cave Gulch and in the chaparral area at the intersection of North Fuel Break Road and Red Hill Road in 2000 (EcoSystems West 2000 as cited in UCSC 2005).
Long-eared myotis *Myotis evotis*	–/WBWG M	Forages in woodlands; roosts in a variety of habitats including mines, buildings, caves, bridges, and rock crevices.	May forage over the sites; suitable roosting habitat present in forest habitat on and/or adjacent to the sites. Detected at UC Santa Cruz in Crown Meadow in 2000 (EcoSystems West 2001 as cited in UCSC 2005).
Fringed myotis *Myotis thysanoides*	–/WBWG H	Roosts in buildings, mines, large conifer snags, and caves.	May forage over the sites; suitable roosting habitat present in forest habitat on and/or adjacent to the sites. Could roost in the old buildings in the vicinity of the Hagar site. Detected in Crown Meadow, along Spring Road, and at the intersection of North Fuel Break Road and Red Hill Road in 2001 (EcoSystems West 2001 as cited in UCSC 2005).
Long-legged myotis *Myotis volans*	–/WBWG H	Roosts in large hollow tree snags, live trees with exfoliating bark, rock crevices, mines, and buildings.	May forage over the sites; suitable roosting habitat present in forest habitat on and/or adjacent to the sites. Detected at the intersection of North Fuel Break Road and Red Hill Road in 2000 (EcoSystems West 2000 as cited in UCSC 2005).

Species	Status (Federal/ State/CRPR)	Habitat	Potential for Occurrence
Yuma myotis *Myotis yumanensis*	–/WBWG LM	Roosts colonially in a variety of natural and human-made sites including caves, mines, buildings, bridges, and trees; in northern California, maternity colonies are usually in fire-scarred redwoods, pines, and oaks; forages for insects over bodies of water.	May forage and roost in forest habitat on and/or adjacent to the sites. Could roost in the old buildings in the vicinity of the Hagar site. Detected in Cave Gulch, at the intersection of North Fuel Break Road and Red Hill Road, and Crown Meadow in 2000 (EcoSystems West 2000 as cited in 2005).
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	–/SSC	Occurs in chaparral, dense stands of northern coastal scrub, oak woodlands.	Suitable habitat present in forest and coyote brush scrub habitat on and/or adjacent to the sites. Woodrat houses observed on north campus and adjacent to lower Moore Creek (EcoSystems West 2002, Jones & Stokes 2004 as cited in UCSC 2005).
American badger *Taxidea taxus*	–/SSC	Occurs in grassland, scrub, and woodland with loose-textured soils.	Suitable habitat present at the Hagar site and in the Porter Meadow near the Heller site. A dead badger was found in 2004 at UC Santa Cruz, north of the Hagar site between the east remote parking lot and the east recreation playing fields (CDFW 2017).

Status Codes:

FE = Federally listed as an endangered species.
FT = Federally listed as a threatened species.
CE = State-listed as an endangered species.
CT = State-listed as a threatened species.
CFP = State-listed as a fully protected species.
SSC = State Species of Special Concern.
1B = California Rare Plant Rank (CRPR): plant considered rare, threatened, or endangered in California and elsewhere.
2B = Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere.
3 = Plants About Which More Information is Needed – A Review List.
4 = Plants of Limited Distribution – A Watch List.
G1 = Critically Imperiled - At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2 = Imperiled - At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
S1 = Critically Imperiled - Critically imperiled in the State because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the State.
S2 = Imperiled - Imperiled in the State because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the State.
WBWG H = Western Bat Working Group - High Priority
WBWG M = Western Bat Working Group - Medium Priority
WBWG LM = Western Bat Working Group - Low-Medium Priority
C = No status

APPENDIX 4.9

Noise Memorandum

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
1 Willowbrook Court, Suite 120
Petaluma, CA 94954

Memo

Date: December 22, 2017

To: Shabnam Barati, Ph.D.
Principal
Impact Sciences

From: Casey T. Zaglin
Staff Consultant
Illingworth & Rodkin, Inc.

Subject: **UC Santa Cruz Student Housing West, Santa Cruz, CA – Noise and Vibration Levels associated with Construction Activities**
I&R Job: 17-070

The proposed UC Santa Cruz Student Housing West (SHW) project is an approximately 3,000-student bed project, which is planned for completion by UC Santa Cruz by 2022. The SHW project is split into two sites: the Hagar Site where the project would construct approximately 148 units of housing for student families northeast of the intersection of Glen Coolidge Drive and Hagar Drive, and the Heller Site where the project would demolish existing buildings and construct approximately 2,852 student beds west of Heller Drive. The project would also construct utility corridors to provide water and wastewater service to the new sites.

This memo presents the results of the noise and vibration assessment of project construction activities. Appendix A presents the fundamentals of environmental noise and vibration for those who may not be familiar with acoustical terminology and/or concepts.

Construction Noise Assessment

Construction noise impacts evaluated in the 2005 Long Range Development Plan (LRDP) EIR[1] were assessed with regard to exceedance of the following significance thresholds:

- 80 dBA L_{eq} (8-hour) during daytime (7:00 a.m. to 7:00 p.m.) and evening (7:00 p.m. to 10:00 p.m.); and
- 70 dBA L_{eq} (8-hour) during nighttime (10:00 p.m. to 7:00 a.m.).

The LRDP EIR determined that construction of campus facilities could expose nearby sensitive receptors to excessive airborne noise but not to excessive groundborne vibration or groundborne

[1] University of California Santa Cruz 2005 Long Range Development Plan Final Environmental Impact Report, University of California Santa Cruz, Office of Physical Planning & Construction, September 2006.

noise. LRDP Mitigation NOIS-1, which is applicable to and included in all projects proposed under the LRDP, requires that the following measures are implemented to minimize construction noise impacts:

LRDP Mitigation NOIS-1: Prior to initiation of construction of a specific development project, the Campus shall approve a construction noise mitigation program that shall be implemented for each construction project. This shall include but not be limited to the following:

- Construction equipment used on campus is properly maintained and has been outfitted with feasible noise-reduction devices to minimize construction-generated noise.
- Stationary noise sources such as generators or pumps are located at least 100 feet away from noise-sensitive land uses as feasible.
- Laydown and construction vehicle staging areas are located at least 100 feet away from noise-sensitive land uses as feasible.
- Whenever possible, academic, administrative, and residential areas that will be subject to construction noise will be informed in writing at least 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 break, Christmas break, Spring break, or Summer breaks.
- Loud construction activity within 100 feet of a residential building shall be restricted to the hours between 7:30 AM and 7:30 PM, Monday through Saturday.
- Loud construction activity within 100 feet of an academic building shall be scheduled to the extent feasible on weekends.

Noise generated by project-related construction activities would be a function of the noise levels generated by individual pieces of construction equipment, the type and amount of equipment operating at any given time, the timing and duration of construction activities, the proximity of nearby sensitive land uses, and the presence or lack of shielding at these sensitive land uses. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor. Construction noise levels would vary on a day-to-day basis during each phase of construction depending on the specific task being completed. Each construction phase would require a different combination of construction equipment necessary to complete the task and differing usage factors for such equipment. Construction noise would primarily result from the operation of heavy construction equipment and the arrival and departure of heavy-duty trucks.

The Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM) was used to calculate the average noise levels anticipated during the worst-case phases of construction that would occur across the site. This construction noise model includes representative sound levels for the most common types of construction equipment and the approximate usage factors of such equipment that were developed based on an extensive database of information gathered during the construction of the Central Artery/Tunnel Project in Boston, Massachusetts (CA/T Project or "Big Dig"). The usage factors represent the percentage of time that the equipment would be operating at full power. Project-specific data was provided by the developer. Project-specific vehicles and equipment anticipated during each phase of construction were input into RCNM to calculate noise levels at the distance of the nearest sensitive receptors to the center of the construction sites (the proposed utility corridor or the building area). Calculations were also made to predict construction noise levels when construction occurs at its closest point to sensitive receptors. These would represent the worst-case condition.

Hagar Site

Construction activities planned at the Hagar site are anticipated to begin in Fall 2018 and end in Fall 2019, lasting approximately 12 months. Project construction phases would include site preparation, grading, building construction, paving, and architectural coating. Off-site construction activities would include trenching, placement of utility lines, backfilling, and restoring the disturbed area. Figure 1 shows the Hagar site and associated utility corridor and the locations of the nearest sensitive receptors. Anticipated construction noise levels, by construction activity and phase, for the typical conditions are summarized in Table 1.

Figure 1 Hagar Site

TABLE 1 Calculated Construction Noise Levels at Nearest Receptors from Center of Construction Sites

Construction Phase	Average Equivalent Noise Level (dBA, L_{eq})		
	Utility Corridor	Hagar Development	
	Southern Residence (Hagar Meadow) (350 feet)	Southeast Residence (Rockridge Lane) (650 feet)	Southwest Residence (Hagar Meadow) (700 feet)
Site Preparation	NA	65	64
Grading	74	69	68
Building Construction	NA	60	59
Paving	NA	62	61
Architectural Coatings	NA	46	45
Overall Range of Construction Noise Levels	74	46-69	45-68

TABLE 2 Calculated Construction Noise Levels at Nearest Receptors from Perimeter of Construction Sites

Construction Phase	Average Equivalent Noise Level (dBA, L_{eq})		
	Utility Corridor	Hagar Development	
	Southern Residence (Hagar Meadow) (200 feet)	Southeast Residence (Rockridge Lane) (220 feet)	Southwest Residence (Hagar Meadow) (320 feet)
Site Preparation	NA	74	71
Grading	79	78	75
Building Construction	NA	69	66
Paving	NA	71	68
Architectural Coatings	NA	55	52
Overall Range of Construction Noise Levels	79	55-78	52-75

The typical levels in Table 1 are used to compare to the noise thresholds established above. The predicted typical construction noise levels resulting from construction activities at distances ranging from 350 feet to 700 feet from the nearest sensitive receptors (i.e., residences to the south) would not exceed the significance thresholds of 80 dBA L_{eq} (8-hour) during daytime and evening periods. The worst-case construction noise levels at the perimeter of the sites are shown in Table 2. During the brief periods when utility construction would occur at the closest point to the nearby southern residences (approximately 200 feet), construction noise levels would be up to 79 dBA L_{eq}. Construction noise levels could potentially exceed 70 dBA L_{eq} (8-hour) during nighttime; however, the implementation of LRDP Mitigation Measure NOIS-1 would reduce the impact to a less-than-significant level by restricting construction to the hours between 7:30 AM and 7:30 PM, Monday through Saturday. No additional mitigation would be required.

Heller Site

Construction activities planned at the Heller site are anticipated to begin in Fall 2019 and end in Fall 2022, lasting approximately 3 years. Project construction phases would include demolition and site preparation, grading, building construction, paving, and architectural coating. Figure 2 shows the project site, utility corridor and the nearest sensitive receptors. Anticipated construction noise levels, by construction activity and phase, for the typical conditions are summarized in Table 3.

Figure 2 Heller Site

TABLE 3 Calculated Construction Noise Levels at Nearest Receptors from Center of Construction Sites

Construction Phase	Average Equivalent Noise Level (dBA, L_{eq})	
	Utility Corridor	Heller Development
	Porter/Kresge College Residences (400 feet)	Rachel Carson College Residences (650 feet)
Demolition and Site Preparation	NA	67
Grading	74	70
Building Construction	NA	69
Paving	NA	64
Architectural Coatings	NA	65
Overall Range of Construction Noise Levels	74	64 to 70

TABLE 4 Calculated Construction Noise Levels at Nearest Receptors from Perimeter of Construction Sites

Construction Phase	Average Equivalent Noise Level (dBA, L_{eq})	
	Utility Corridor	Heller Development
	Porter/Kresge College Residences (200 feet)	Rachel Carson College Residences (350 feet)
Demolition and Site Preparation	NA	72
Grading	80	75
Building Construction	NA	74
Paving	NA	69
Architectural Coatings	NA	70
Overall Range of Construction Noise Levels	80	69 to 75

The typical levels in Table 3 are used to compare to the noise thresholds. The predicted typical construction noise levels resulting from construction activities at distances ranging from 400 feet to 650 feet from the nearest sensitive receptors (i.e., residences at Porter, Kresge, and Rachel Carson Colleges) would not exceed the significance thresholds of 80 dBA L_{eq} (8-hour) during daytime and evening periods. The worst-case construction noise levels at the perimeter of the sites are shown in Table 4. During the brief periods when construction would occur at the closest point to the nearby Porter/Kresge College residences (approximately 200 feet), construction noise levels would be up to 80 dBA L_{eq}. Construction noise levels could potentially exceed 70 dBA L_{eq} (8-hour) during nighttime; however, the implementation of LRDP Mitigation Measure NOIS-1 would reduce the impact to a less-than-significant level by restricting construction to the hours between 7:30 AM and 7:30 PM, Monday through Saturday. No additional mitigation would be required.

Construction Vibration Assessment

The LRDP EIR determined that construction of future projects on the campus would not expose sensitive receptors to excessive groundborne vibration or groundborne noise because construction techniques having the potential of yielding relatively high vibration levels, such as pile driving or blasting, were not anticipated. Nonetheless, an evaluation was conducted to confirm that the construction activities associated with the proposed project would not result in excessive groundborne vibrations.

For structural damage, the California Department of Transportation recommends a vibration limit of 0.5 inches/second, peak particle velocity (in/sec PPV) for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for older residential buildings, and 0.25 for historic and some old buildings. All buildings in the project vicinity are assumed to be structurally sound, but these buildings may or may not have been designed to modern engineering standards.

Table 5, below, presents typical vibration levels that could be expected from construction equipment at 25 feet. Vibration levels produced by a vibratory roller (0.210 in/sec PPV at 25 feet) would represent a credible worst-case scenario for proposed construction activities.

TABLE 5 Vibration Levels for Construction Equipment

Equipment		Vibration Levels at Representative Distances			
		PPV at 25 ft. (in/sec)	PPV at 200 ft. (in/sec)	PPV at 220 ft. (in/sec)	PPV at 350 ft. (in/sec)
Clam shovel drop		0.202	0.021	0.018	0.011
Hydromill (slurry wall)	in soil	0.008	0.001	0.001	0.000
	in rock	0.017	0.002	0.002	0.001
Vibratory Roller		0.210	0.021	0.019	0.012
Hoe Ram		0.089	0.009	0.008	0.005
Large bulldozer		0.089	0.009	0.008	0.005
Caisson drilling		0.089	0.009	0.008	0.005
Loaded trucks		0.076	0.008	0.007	0.004
Jackhammer		0.035	0.004	0.003	0.002
Small bulldozer		0.003	0.000	0.000	0.000

Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006.

Of the equipment listed in Table 5 above, a vibratory roller would produce the highest vibrations and was used to estimate potential off-site vibrations. Vibration levels are highest close to the source, and then attenuate with increasing distance at the rate $(D_{ref}/D)^{1.1}$, where D is the distance from the source in feet and D_{ref} is the reference distance of 25 feet. [2] Using the attenuation rate above, a vibratory roller would produce vibration levels of 0.021 in/sec PPV when construction occurs at its closest point to receptors. The receptors represented by this worst-case scenario

[2] These levels are based on calculations assuming normal propagation conditions, using a standard equation of $PPV_{eqmt}=PPV_{ref}*(25/D)^{1.1}$.

include the residences 200 feet south of the utility corridor at the Hagar site and Porter/Kresge College residences 200 feet east of the utility corridor at the Heller site. Vibration levels at the 220 foot distance are calculated to occur at the residences south of the Hagar site. Vibration levels at the 350 foot distance are calculated to occur at the Rachel Carson College residences east of the Heller site. At these distances, vibration levels would not approach or exceed the 0.25 or the 0.3 in/sec PPV threshold used to assess the potential for cosmetic damage (e.g., minor cracks in plastered walls or the loosening of paint) at older residential buildings. There would be no impact to buildings in the vicinity of the project site because of the distance separating the buildings from proposed construction activities. Groundborne vibration levels resulting from proposed construction equipment could be perceptible at times. A vibration limit of 0.1 in/sec PPV, produced by continuous/frequent intermittent sources of construction vibration would be strongly perceptible and would cause human annoyance. As shown in Table 3, vibration levels would be below this threshold and represented nearby receptors. No mitigation would be required.

APPENDIX A: FUNDAMENTALS OF NOISE AND VIBRATION

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table A-1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table A-2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table A-3 displays the reactions of people and the effects on buildings that continuous vibration levels produce.

The annoyance levels shown in Table A-3 should be interpreted with care since vibration may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related ground-borne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess ground-borne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Damage caused by vibration can be classified as cosmetic or structural. Cosmetic damage includes minor cracking of building elements (exterior pavement, room surfaces, etc.). Structural damage includes threatening the integrity of the building. Damage resulting from construction related vibration is typically classified as cosmetic damage. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

TABLE A-1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e. g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting 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.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE A-2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), California Department of Transportation, September 2013.

TABLE A-3 Reaction of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Virtually no risk of damage to normal buildings
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential dwellings such as plastered walls or ceilings
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to newer residential structures

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

APPENDIX 4.11

Trip Estimates & Traffic Memorandum

Trip Generation Estimates

UCSC Campus Vehicle Trip Generation at External Gateways, based on Spring 2016 Travel Surveys
Larry Pageler, UCSC TAPS
Created: January 29, 2018
Revised: March 14, 2018

Actual Spring 2017 ADT: 22,764

Table 10. Existing Conditions (2017) 2016 UCSC trip rates for students and employees, FEIR trip rates for "All Others" and 2016-17 3/4 average enrollment and on-campus residential population
Results: Total vehicle trip estimates match of the average weekday traffic counts collected in Spring 2017.

			Spring 2017		Spring 2017	Vehicle Trip Distributions						Vehicle Trips							
New Scenario 1	Housing Type	Unit	Enrollment / Persons	% of Total Students	Daily	AM Total	AM In	AM Out	PM Total	PM In	PM Out	Daily	AM Total	AM In	AM Out	PM Total	PM In	PM Out	
New "Existing Conditions (2017)" based on **2016-17 3/4 Average Population** w/ UCSC Vehicle Trip Rates derived from **Spring 2016** Travel Survey	On-campus	FTE	9,269	52%	**0.734**	0.064	0.049	0.016	0.090	0.035	0.055	**6,803**	0	0	0	0	0	0	
	Off-campus	FTE	8,601	48%	**1.031**	0.064	0.049	0.016	0.090	0.035	0.055	**8,869**	0	0	0	0	0	0	
	Total Students	FTE	17,870	100%	*0.877*	0.064	0.049	0.016	0.090	0.035	0.055	**15,673**	0	0	0	0	0	0	
	UC Employees	Persons	3,418		**1.828**	0.064	0.049	0.016	0.090	0.035	0.055	**6,247**	0	0	0	0	0	0	
	All Other	Persons	556		**1.519**	0.064	0.049	0.016	0.090	0.035	0.055	**845**	0	0	0	0	0	0	
	Total Trip Gen	Persons	21,844		*1.042*							**22,765**	**0**	**0**	**0**	**0**	**0**	**0**	0.00%
												Actual ADT splits:	*1,460*	*1,115*	*353*	*2,039*	*810*	*1,256*	
												% Error:	*-100.00%*	*-100.00%*	*-100.00%*	*-100.00%*	*-100.00%*	*-100.00%*	

Table 11a. Year 2020 Conditions (2005 LRDP) 2016 UCSC trip rates applied to 2005 LRDP population projections (47% of students living on campus)
Results: Lower actual trip rates result in lower total vehicle trip forecasts than anticipated by the 2005 LRDP EIR.

			Spring 2017		Spring 2017	Vehicle Trip Distributions						Vehicle Trips							
New Scenario 2	Housing Type	Unit	Enrollment / Persons	% of Total Students	Daily	AM Total	AM In	AM Out	PM Total	PM In	PM Out	Daily	AM Total	AM In	AM Out	PM Total	PM In	PM Out	
New "Year 2020 Conditions (2005 LRDP)" based on **2016-17 3/4 Average Population** w/ UCSC Vehicle Trip Rates derived from **Spring 2016** Travel Survey	On-campus	HC	9,190	47%	**0.734**	0.064	0.049	0.016	0.090	0.035	0.055	**6,745**	0	0	0	0	0	0	
	Off-campus	HC	10,310	53%	**1.031**	0.064	0.049	0.016	0.090	0.035	0.055	**10,631**	0	0	0	0	0	0	
	Total Students	FTE	19,500	100%	*0.891*	0.064	0.049	0.016	0.090	0.035	0.055	**17,377**	0	0	0	0	0	0	
	UC Employees	Persons	4,499		**1.828**	0.064	0.049	0.016	0.090	0.035	0.055	**8,223**	0	0	0	0	0	0	
	All Other	Persons	750		**1.519**	0.064	0.049	0.016	0.090	0.035	0.055	**1,140**	0	0	0	0	0	0	
	Total Trip Gen	Persons	24,749		*1.080*							**26,739**	**0**	**0**	**0**	**0**	**0**	**0**	17.46%
									Original LRDP EIR Figures:			*32,044*	*1,886*	*1,473*	*414*	*2,595*	*1,038*	*1,558*	

Table 13. Year 2020 without Project Conditions 2016 UCSC trip rates for students and employees, FEIR trip rates for visitors, updated 2020 population projections without the proposed housing project (48% of students living on campus)
Results: Lower actual trip generation rates result in lower vehicle trip forecasts in Year 2020.

			Spring 2017		Spring 2017	Vehicle Trip Distributions						Vehicle Trips							
New Scenario 4	Housing Type	Unit	Enrollment / Persons	% of Total Students	Daily	AM Total	AM In	AM Out	PM Total	PM In	PM Out	Daily	AM Total	AM In	AM Out	PM Total	PM In	PM Out	
New "Year 2020 without Project Conditions" based on **2016-17 3/4 Average Population** w/ UCSC Vehicle Trip Rates derived from **Spring 2016** Travel Survey	On-campus	HC	9,269	48%	**0.734**	0.064	0.049	0.016	0.090	0.035	0.055	**6,803**	0	0	0	0	0	0	
	Off-campus	HC	10,231	52%	**1.031**	0.064	0.049	0.016	0.090	0.035	0.055	**10,550**	0	0	0	0	0	0	
	Total Students	FTE	19,500	100%	*0.890*	0.064	0.049	0.016	0.090	0.035	0.055	**17,353**	0	0	0	0	0	0	
	UC Employees	Persons	3,994		**1.828**	0.064	0.049	0.016	0.090	0.035	0.055	**7,300**	0	0	0	0	0	0	
	All Other	Persons	640		**1.519**	0.064	0.049	0.016	0.090	0.035	0.055	**972**	0	0	0	0	0	0	
	Total Trip Gen	Persons	24,134		*1.062*							**25,626**	**0**	**0**	**0**	**0**	**0**	**0**	12.57%

Table 14. Year 2023 with Project Conditions (2017 LRDP) 2016 UCSC trip rates for students and employees, FEIR trip rates for visitors, updated 2020 population projections with the proposed housing project (58% of students living on campus)
Results: Lower actual trip generation rates result in lower vehicle trip forecasts in Year 2020. Overall project benefit = trip reduction of 2.9%.

			Spring 2017		Spring 2017	Vehicle Trip Distributions						Vehicle Trips							
New Scenario 5	Housing Type	Unit	Enrollment / Persons	% of Total Students	Daily	AM Total	AM In	AM Out	PM Total	PM In	PM Out	Daily	AM Total	AM In	AM Out	PM Total	PM In	PM Out	
New "Year 2023 with Project Conditions" based on **2016-17 3/4 Average Population** w/ UCSC Vehicle Trip Rates derived from **Spring 2016** Travel Survey	On-campus	HC	11,382	58%	**0.734**	0.064	0.049	0.016	0.090	0.035	0.055	**8,354**	0	0	0	0	0	0	
	Off-campus	HC	8,118	42%	**1.031**	0.064	0.049	0.016	0.090	0.035	0.055	**8,371**	0	0	0	0	0	0	
	Total Students	FTE	19,500	100%	*0.858*	0.064	0.049	0.016	0.090	0.035	0.055	**16,725**	0	0	0	0	0	0	
	UC Employees	Persons	3,994		**1.828**	0.064	0.049	0.016	0.090	0.035	0.055	**7,300**	0	0	0	0	0	0	
	All Other	Persons	640		**1.519**	0.064	0.049	0.016	0.090	0.035	0.055	**972**	0	0	0	0	0	0	
	Total Trip Gen	Persons	24,134		*1.036*							**24,998**	**0**	**0**	**0**	**0**	**0**	**0**	9.81% -2.76%

Intersection Operations and Multimodal Site Access Evaluation Memorandum

FEHR & PEERS

MEMORANDUM

Date: March 19, 2018

To: Shabnam Barati, Impact Sciences

From: Lilian Ayala, Vicki Caudullo, Daniel Rubins, and Matt Haynes, Fehr & Peers

Subject: Student Housing West Project – Intersection Operations and Multimodal Site Access Evaluation

SJ17-1725

The purpose of this memorandum is to present the intersection operations and multimodal site access evaluation for the proposed Family Student Housing and Childcare facility proposed for construction on a 15-acre site in the northeast corner of the intersection of Hagar Drive and Glenn Coolidge Drive ("Hagar site") as part of the *Student Housing West Project*.

KEY FINDINGS

The conclusions from the intersection operations and multimodal site access evaluation for the Project are summarized below. Operational improvements for UC Santa Cruz staff to consider are also presented below:

- The Hagar Drive / Glenn Coolidge Drive intersection operates at an acceptable Level of Service (LOS) under each scenario evaluated (Existing Conditions, 2020 without Project, and 2020 with Project Conditions).
- For each scenario, the eastbound left turn vehicle traffic at Hagar Drive / Glenn Coolidge Drive extends beyond the available storage pocket. If desired, the campus could consider operational improvements such as lengthening the eastbound storage pocket by 50 to 100 feet.
- Existing pedestrian facilities only provide direct access to the bus stop on the south side of Glenn Coolidge Drive east of Ranch View Road. The construction of a marked crosswalk and paved path on the north side of Glenn Coolidge Drive from Hagar Drive to the north side bus stop would provide a more direct path to the existing bus stop.

The project driveway located approximately 500 feet north of Glenn Coolidge Drive on Hagar Drive will operate at LOS F, which does not meet desired UCSC driveway operating conditions during the evening peak hour. Thus, if LOS F driveway operations would be considered unacceptable by UCSC, an alternate operational improvement is to construct right-in-right-out (i.e. no left turns permitted) driveways on both Hagar Drive and Glenn Coolidge Drive, or construct two driveway access points on Hagar Drive. A third option is to construct a separate southbound left turn on Hagar Drive to the project driveway, this would only have slight improvement in the driveway operations. The placement of the driveway on Glenn Coolidge Drive would need to be located with adequate site distance and acceptable acceleration and deceleration lanes.

PROJECT DESCRIPTION

The Hagar site is one of two sites for the *Student Housing West Project*. The Project is located in the undeveloped northeast corner of the intersection of Glenn Coolidge Drive / Hagar Drive and includes 148 family student housing units and a 13,500 square foot childcare center that will accommodate 140 children. The new housing on the Hagar site would replace 148 of the 196 existing units on the Heller site.

INTERSECTION OPERATIONS ANALYSIS METHODS

This study evaluated the overall traffic operations during the morning (AM) and evening (PM) peak hours at the following intersections:

1. Hagar Drive and Glenn Coolidge Drive (existing; signalized)
2. Hagar Drive and New Driveway (new; unsignalized)

The operations of roadway facilities are typically described with the term Level of Service (LOS), a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, which reflects free-flow conditions where there is very little interaction between vehicles, to LOS F, where the vehicle demand exceeds the capacity and high levels of vehicle delay result. LOS E represents “at-capacity” operations. When traffic volumes exceed the intersection capacity, stop-and-go conditions result and a vehicle may wait through multiple signal cycles before passing through the intersection; these operations are designated as LOS F. Methods used to evaluate the LOS at the signalized and unsignalized (stop sign controlled) intersections are described in the following sections.

SIGNALIZED INTERSECTIONS

This study used the method described in Chapter 18 of the 2010 *Highway Capacity Manual* (*2010 HCM*) and the Synchro analysis software to prepare peak hour LOS calculations for the signalized Hagar Drive/Glenn Coolidge Drive study intersection. The operation of signalized intersections is analyzed based on various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the average control delay experienced by motorists traveling through an intersection. Control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 1** summarizes the relationship between average delay per vehicle and level of service (LOS) for signalized intersections.

TABLE 1: SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0
E	Operations with long delays indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80.0

Source: *Highway Capacity Manual* (Transportation Research Board), 2010.

UNSIGNALIZED INTERSECTIONS

The operations of the unsignalized intersection of Hagar Drive and proposed driveway was evaluated using the methods contained in Chapter 19 of the 2010 *HCM*. At two-way or side street-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, as well as the left-turn movement from the major street, and the entire intersection. For controlled approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. The delays for the entire intersection and for the movement or approach with the highest delay are reported. **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections.

TABLE 2: UNSIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delays	≤ 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded.	> 50.0

Source: *Highway Capacity Manual* (Transportation Research Board), 2010.

The *2005 UC Santa Cruz Long Range Development Plan (LRDP) Draft Environmental Impact Report (EIR)* set forth LOS thresholds that are used on the campus to evaluate traffic impacts. According to the LRDP EIR, LOS D is the minimum acceptable LOS for UC Santa Cruz for intersections in the lower campus and LOS E is the minimum acceptable LOS for intersections in the central and north campus.

EXISTING CONDITIONS

The following section describes the existing roadway network, along with existing pedestrian, bicycle, and transit facilities near the proposed Project. Existing intersection LOS analysis results are also provided for the study intersection at Hagar Drive and Glenn Coolidge Drive.

EXISTING STREET NETWORK

The following roadway facilities are relevant to this analysis:

- *Hagar Drive* is a north-south, two-lane, street west of the Project site that extends from Glenn Coolidge Drive to the north to McLaughlin Drive within the campus.
- *Glenn Coolidge Drive* is an east-west, two-lane, street south of the Project site. Glenn Coolidge Drive extends from High Street near the campus entrance to McLaughlin Drive.

EXISTING PEDESTRIAN FACILITIES

Pedestrian facilities consist of sidewalks, crosswalks, and at signalized intersections pedestrian signals. The pedestrian network near the site includes a sidewalk on the east side of Hagar Drive, and marked crosswalks on the east and south legs of the Hagar Drive and Glenn Coolidge Drive intersection. A sidewalk on the south side of Glenn Coolidge between Hagar Drive and Ranch View Road connects to a local bus stop. At the intersection of Glenn Coolidge Drive and Ranch View Road, a marked crosswalk exists on the east leg, and a sidewalk on the north side of Glenn Coolidge connects to a local bus stop. A sidewalk gap exists between the bus stop (on the north side of Glenn Coolidge Drive) and Hagar Drive on the north side of Glenn Coolidge Drive.

EXISTING BICYCLE FACILITIES

Bicycle lanes currently exist on Hagar Drive and Glenn Coolidge Drive near the project site.

EXISTING TRANSIT FACILITIES

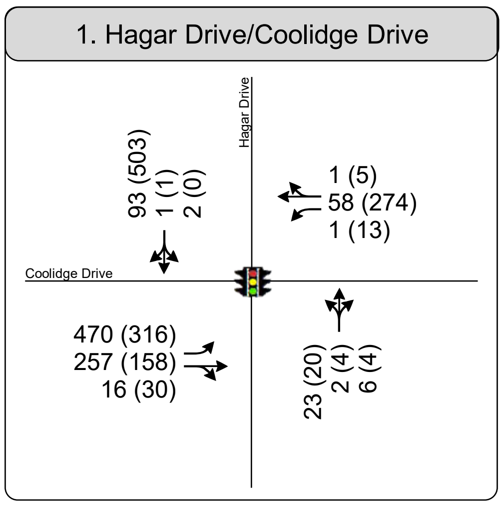
Bus stops are located on both sides of Glenn Coolidge Drive just east of the intersection of Glenn Coolidge Drive / Ranch View Road. These bus stops are served by Santa Cruz Metro Routes 10, 15, 16, 19, 20 and 22, and UC Santa Cruz shuttles.

INTERSECTION OPERATIONS

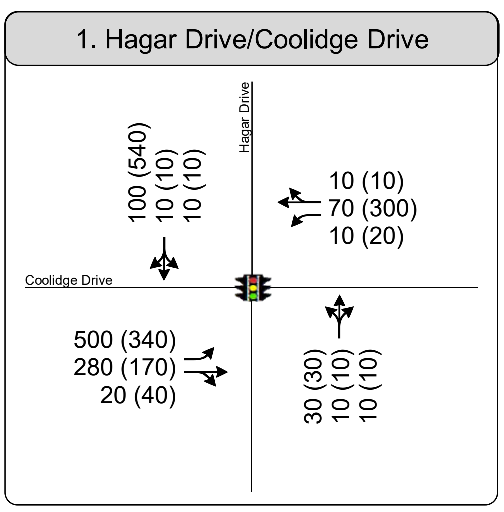
Intersection turning movement vehicle, pedestrian, and bicycle counts were collected at the Hagar Drive / Glenn Coolidge Drive intersection during the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods on Thursday, December 7, 2017. The intersection counts are provided in **Attachment A**. For the study intersection, the single hour with the highest traffic volumes during the count period was identified. The AM and PM peak hour intersection volumes are shown on **Figure 1**.

Table 3 shows the intersection level of service at the Hagar Drive and Glenn Coolidge Drive intersection under Existing Conditions. **Attachment B** contains the analysis sheets documenting the intersection level of service calculations. The results indicate that the Hagar Drive and Glenn Coolidge Drive intersection operates at an acceptable service level in the Existing Conditions during the AM and PM peak hours.

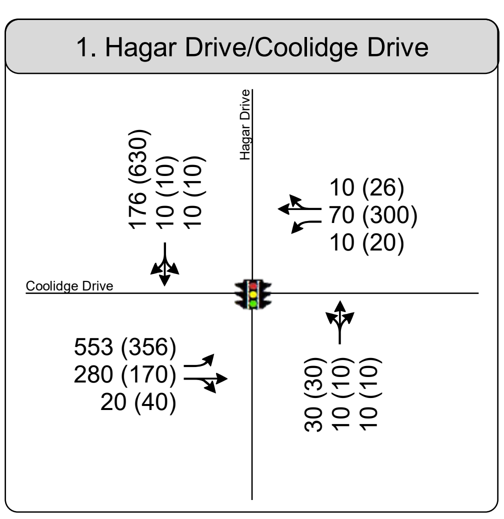
Existing Conditions

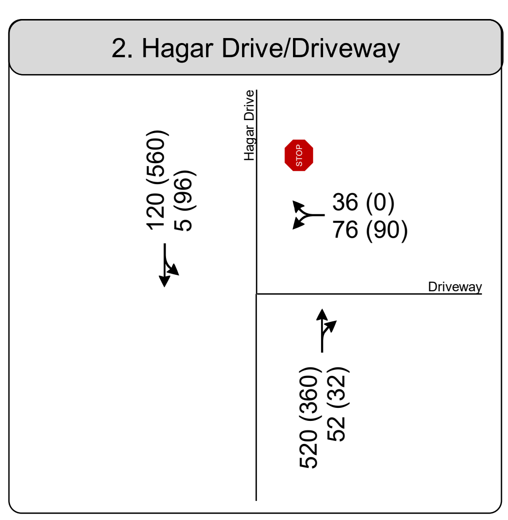


2020 without Project Conditions



2020 With Project Conditions





LEGEND

#	Study Intersection
AM (PM)	Peak Hour Traffic Volume
	Lane Configuration
	Signalized

Figure 1

Peak Hour Traffic Volumes and Lane Configurations
Student Housing West - Hagar Site

TABLE 3: EXISTING CONDITIONS INTERSECTION LEVEL OF SERVICE

Intersection	Traffic Control	Jurisdiction (LOS Standard)	Peak Hour	Average Delay[1]	LOS
1. Hagar Drive and Glenn Coolidge Drive	Signalized	UC Santa Cruz (D)	AM PM	8.7 15.5	A B

1. Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.

Source: Fehr & Peers, March 2018.

FIELD OBSERVATIONS

Field observations at the Project site and study intersections were conducted while UC Santa Cruz classes were in session to confirm intersection operations results. During the AM and PM peak periods, stopped vehicles were observed predominately for the eastbound left-turn movement at the intersection. The eastbound left turn vehicles often exceed the left turn pocket storage, but typically clear within a single signal cycle. Slowing of southbound vehicle traffic was observed along Hagar Drive north of Coolidge Drive with a short line of stopped vehicles at the north leg of the Hagar Drive and Glenn Coolidge Drive intersection, In general, field observations indicated that the study intersection is operating at a similar calculated LOS value.

PROJECT CONDITIONS

The results of the LOS calculations under 2020 without Project Conditions and 2020 with Project Conditions are presented below.

The 2020 without Project Conditions assess the impact of non-project traffic in the year 2020. These volumes were projected using an annual growth factor rate of two percent. The annual growth factor rate was derived from the growth factors used in the *2005 UC Santa Cruz Long Range Development Plan (LRDP) Draft Environmental Impact Report (EIR)*. The annual growth rate of two percent used to project 2020 volumes is greater than the historical annual growth rates of the total entering volume of traffic from 2003 to 2017 at the Hagar Drive / Glenn Coolidge Drive intersection (one percent for the AM peak hour and 0.2 percent for the PM peak hour). The 2020 with Project Conditions volumes were projected by adding the Project-related vehicle trips to the 2020 without Project Conditions volumes. These volumes are documented in **Figure 1**. The method for estimating, distributing, and assigning trips generated by the project are described below.

TRIP GENERATION, DISTRIBUTION, AND ASSIGNMENT

The project trips to be added by the Project during the AM and PM peak hours were estimated based on data provided by UC Santa Cruz staff, trip generation rates derived from the spring 2017 traffic count data, and data published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th Edition (2017). The results are presented in **Table 4**.

The proposed Project is student family housing that will be replacing existing family housing units at the Heller Site, and a childcare center for children of students, faculty, and staff. Most of the children at the childcare center will be children from families living on the Project site and the remaining will be faculty and staff children dropped-off or picked-up as a part of trips traveling from off-campus into the campus or dropped off by walking to the childcare center from the nearby employee housing. The trip generation described below is the trip generation at the project driveways. For this analysis, the project trips are considered new trips just at the project driveway and Hagar Drive / Glenn Coolidge Drive intersection.

The Project would generate 1,711 daily vehicle trips, 169 AM peak hour trips (57 inbound and 112 outbound) and 218 PM peak hour trips (128 inbound and 90 outbound). **Table 4** summarizes the trip generation results. The trip generation and off-site vehicle distribution is described below for each land use. The assignment of the childcare center and student family housing trips are shown in **Figure 2**.

Family Student Housing

The student family housing units of the Project are estimated to generate 110 AM peak hour trips (27 inbound and 83 outbound) and 147 PM peak hour trips (93 inbound and 54 outbound). The distribution of the family housing trips is 90 percent of trips traveling on Glenn Coolidge Drive west of Hagar Drive and 10 percent of trips traveling on Hagar Drive north of Glenn Coolidge Drive. A majority of the trips are assumed to be trips by non-student family members that work off-campus; therefore, most of the student family housing trips are assigned as traveling on Glenn Coolidge Drive to and from the campus's main entrance.

Childcare Center

Information regarding the portion of enrolled children living on-campus and off-campus was provided by UC Santa Cruz staff in March 2018, and is summarized below:

1) 112 of the 140 children will be enrolled in the all-day program and 28 will be enrolled in the after-school program

2) Children of UC Santa Cruz students: 60 kids
    a. 49 would live on the Hagar site
    b. 11 would live off-campus
3) Children of UC Santa Cruz employees: 80 kids
    a. 48 would live in on-campus employee housing
    b. 32 would live off-campus

Based on the information above, we assume that children living at the Hagar site would be dropped-off or picked-up as a part of the housing trips traveling in and out of the site, or dropped off by walking to the childcare center. Therefore, these children would not generate new vehicle trips at the Project driveway. Children living off-campus will be dropped-off or picked-up as a part of trips traveling from off-campus into the campus at the childcare center. For children living at on-campus faculty housing units, we assume that half of them will be dropped off by driving while the remaining will be dropped off by walking to the childcare center. Detailed calculations are presented in **Attachment C**.

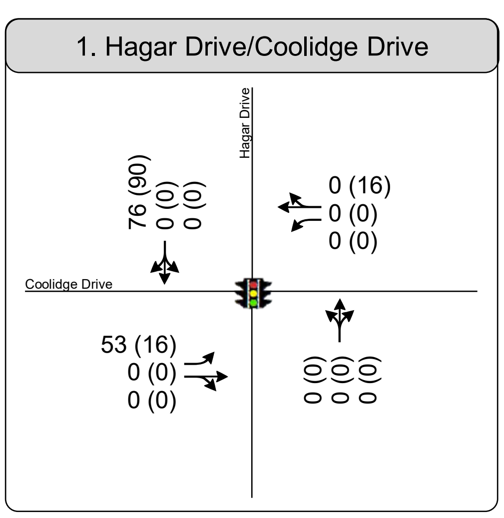
The net new childcare center trips occurring outside the project site would be 314 daily trips, 59 AM peak hour trips (30 inbound and 29 outbound) and 71 PM peak hour trips (35 inbound and 36 outbound). Of the childcare center trips occurring outside of the project site, 95 percent of AM peak hour inbound trips are assumed to travel east on Glenn Coolidge Drive to the site, and 95 percent of AM peak hour outbound trips are assumed to continue traveling north on Hagar Drive from the site. While most childcare external trips are assumed to travel from off campus in the AM, a small percentage (5 percent) of inbound trips are assumed to travel south on Hagar Drive to the site, and some outbound trips are assumed to travel west on Glenn Coolidge Drive from Hagar Drive. For the PM peak hour, 75 percent of childcare center inbound trips are assumed to travel south on Hagar Drive to the site, and the remaining trips (25 percent) are assumed to split evenly between eastbound and westbound Glenn Coolidge Drive; 100 percent of childcare center outbound trips will travel west on Glenn Coolidge Drive from Hagar Drive.

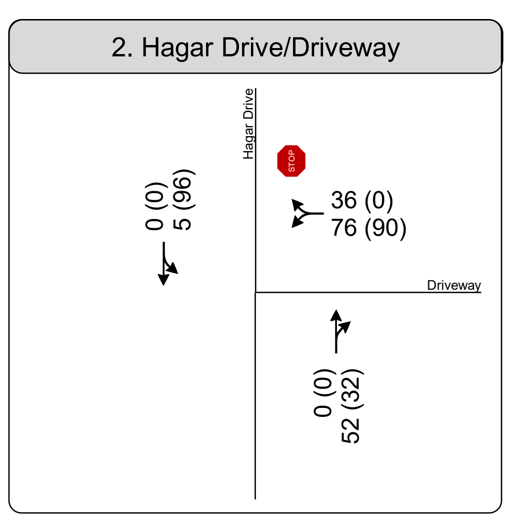
TABLE 4: TRIP GENERATION

Land Use		Size	Unit	Daily	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
Student Family Housing (A)[1]		148	Units	1,397	110	27	83	147	93	54
Childcare Center[2]	Children of Students (B)	60	Kids	44	10	5	5	12	6	6
	Children of Employees (C)	80	Kids	229	46	23	23	56	28	28
	Employees (D)	30	Emp	41	3	2	1	3	1	2
	–Total Trip Generation (E = B+C+D)			*314*	*59*	*30*	*29*	*71*	*35*	*36*
Net New Vehicle Trip Generation (A + E)				**1,711**	**169**	**57**	**112**	**218**	**128**	**90**

1. ITE Trip Generation Manual 10th Edition, September 2017.
2. Base trip rates for childcare center: 4 trips per kid per day (2 inbound and 2 outbound); 2 trips per kid (1 inbound and 1 outbound) during the drop-off and pick-up times. Trip rates for employees are based on campus-wide employee vehicle trip generation rates, derived from 2016 driveway counts.

Source: Fehr & Peers, March 2018.





LEGEND

- # Study Intersection
- AM (PM) Peak Hour Traffic Volume
- Lane Configuration
- Signalized

Figure 2

Trip Assignment

Student Housing West - Hagar Site

INTERSECTION OPERATIONS

Intersection levels of service were calculated for the two study intersections in the 2020 without Project Conditions and 2020 with Project Conditions. The LOS calculations are presented in **Attachment B** and summarized in **Table 5**. The LOS results for the Hagar Drive and Glenn Coolidge Drive intersection from the *2005 UCSC LRDP Draft EIR* are presented alongside the results of the new analysis based on the 2017 counts (referred to as the '2018 Analysis' in the table below). Please note that slightly different methods and inputs were used for the *2005 UCSC LRDP Draft EIR* utilized 2000 HCM methods and TRAFFIX software to calculate intersection operations.

The LOS analysis results indicate that the existing signalized intersection will perform at acceptable levels in the 2020 without Project and 2020 with Project Conditions. The project driveway will operate unacceptably under the evening peak hour conditions. The results for the signalized study intersection are consistent to the *2005 UCSC LRDP Draft EIR* results, with minor differences in average delay and LOS calculations.

TABLE 5: 2020 WITHOUT PROJECT CONDITIONS AND WITH PROJECT CONDITIONS INTERSECTION LEVEL OF SERVICE

Intersection[1]	Peak Hour	2020 without Project				2020 with Project			
		2005 LRDP		2018 Analysis		2005 LRDP		2018 Analysis	
		Average Delay[2]	LOS	Average Delay[2]	LOS	Average Delay[2]	LOS	Average Delay[2]	LOS
1. Hagar Drive and Glenn Coolidge Drive	AM PM	9.9 10.8	A B	10.1 16.1	B B	11.5 14.5	B B	11.9 19.6	B B
2. Hagar Drive and Project Driveway	AM PM	N/A	N/A	N/A	N/A	N/A	N/A	17.2 **51.5**	C **F**

1. Hagar Drive/Glenn Coolidge Drive is signalized, and Hagar Drive/Driveway is side-street stop controlled.
2. Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.
3. An LOS of D is the UC Santa Cruz LOS standard for intersections on the lower campus. For driveways the LOS standard is LOS C.

Source: Fehr & Peers, March 2018.

Based on the above analysis results, the Hagar Drive / Glenn Coolidge Drive intersection is expected to operate well during AM and PM peak hours. The eastbound left turn demand is expected to continue to exceed the storage length in the future conditions. If desired, the campus could consider operational improvements such as lengthening the eastbound storage pocket by 50 to 100 feet. Lengthening the storage pocket would block fewer eastbound through vehicles on Glenn Coolidge Drive at Hagar Drive and better accommodate the 50 inbound vehicles in the morning.

Increasing the eastbound storage length at the Hagar Drive / Glenn Coolidge Drive intersection would necessitate a similar reduction in the westbound left turn storage pocket at the Glenn Coolidge Drive / Ranch View Road-Carriage House Road intersection. This would have a minimal impact on the westbound left traffic at Glenn Coolidge Drive / Ranch View Road-Carriage House Road intersection as historical peak hour counts from the 2005 *UCSC LRDP Draft EIR* report fewer than 20 vehicles make the westbound left turn movement onto Ranch View Road.

The side-street stop controlled Project driveway on Hagar Drive is anticipated to operate unacceptably (LOS F) under the evening peak hour. This intersection does not meet peak hour signal warrants.[1] Warrant 3A and 3B Peak Hour signal warrant analysis can be found in **Attachment D**. The UCSC campus preference is for right-in-right-out project driveways on Hagar Drive and Glenn Coolidge Drive. With two project driveways, the nearby signalized intersection at Hagar Drive and Glenn Coolidge Drive intersection and both project driveways would operate acceptably (the level of service analysis is included in **Attachment E**).

---

[1] Signal warrant analysis is intended to examine the general correlation between the planned level of future development and the need to install new traffic signals. It estimates future development-generated traffic compared to a sub-set of the standard traffic signal warrants recommended in the 2014 California *Manual on Uniform Traffic Control Devices* (CA *MUTCD*) guidelines. While satisfying one or more of these warrants could justify the installation of a signal at an intersection, this analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated by an experienced engineer based on field-measured rather than forecast traffic data and a thorough study of traffic and roadway conditions. Furthermore, the decision to install a signal should not be based solely upon the warrants, since the installation of signals may lead to certain types of collisions. UCSC staff should undertake regular monitoring of actual traffic conditions and accident data, and timely re-evaluation of the full set of warrants to prioritize and program intersections for signalization.

Potential ways to improve the improve driveway operations for this project include:

- Construct right-in-right-out (i.e. no left turns permitted) driveways on both Hagar Drive and Glenn Coolidge Drive.
- Construct two driveway access points on Hagar Drive.
- Construct a separate southbound left turn on Hagar Drive to the project driveway, this would only have slight improvement in the driveway operations to LOS E.

The placement of the driveway on Glenn Coolidge Drive would need to be located with adequate site distance and acceptable acceleration and deceleration lanes. Upon completion of the final site plan, Campus staff should conduct a supplemental site access review to confirm the driveway design meets state of practice expectations.

SITE ACCESS REVIEW

The site plan from December 5, 2017 was reviewed to evaluate site access for pedestrians, bicycles, and vehicles to the Project. Pedestrian trips to the site would primarily be trips from the bus stops west of the Hagar Drive / Glenn Coolidge Drive intersection. To access the site, pedestrians would travel east on the south side of Glenn Coolidge Drive from the bus stop then north on Hagar Drive. Currently, there are paved paths on the east side of Hagar Drive north of the study intersection and on the south side of Glenn Coolidge Drive west of the intersection; therefore, direct pedestrian access from the project site to transit is only available to the stop on the south side of Glenn Coolidge Drive. The existing dirt footpath formed on the north side of Glenn Coolidge Drive from the study intersection to the bus stop suggests a desire for a paved path to the stop on both sides of Glenn Coolidge Drive.

Adding a paved path and crosswalk along the desired pedestrian travel route to the north side Glenn Coolidge Drive bus stop would assist pedestrian access from the project site to transit. The addition of a marked crosswalk to the north leg of the Hagar Drive / Glenn Coolidge Drive study intersection would have minimal to no effect on LOS, as shown in **Table 6** below. Along with providing direct access for pedestrians, providing paths with widths of at least four feet with five feet passing spaces at intervals of 200 feet (or 5 foot paths along the entire length), as described in the *2010 ADA Standards for Accessible Design*, would provide accessible paths from the project site to the bus stops on Glenn Coolidge Drive.

TABLE 6: 2020 CONDITIONS INTERSECTION LEVEL OF SERVICE

Intersection[1]	Peak Hour	2020 without Project		2020 with Project		2020 with Project and North Leg Crosswalk	
		Average Delay[2]	LOS	Average Delay[2]	LOS	Average Delay[2]	LOS
1. Hagar Drive and Glenn Coolidge Drive	AM PM	10.1 16.1	B B	11.9 19.6	B B	12.1 19.8	B B

1. Hagar Drive/Coolidge Drive is signalized.
2. Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.
3. An LOS of D is the LOS standard.

Source: Fehr & Peers, January 2018.

ATTACHMENTS

Attachment A – Existing Traffic Counts
Attachment B – LOS Calculations
Attachment C – Trip Generation for Proposed Childcare Center
Attachment D – CA MUTCD Signal Warrant 3A and 3B Peak Hour Analysis of Hagar Drive / Project Driveway in the PM Peak Hour
Attachment E – LOS Calculations with Two Driveways

ATTACHMENT A. EXISTING TRAFFIC COUNTS

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Groups Printed- Lights - Buses - Trucks

	HAGAR DR Southbound					COOLIDGE DR Westbound					HAGAR CT Northbound					COOLIDGE DR Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	12	0	0	0	12	0	11	0	1	12	1	0	5	1	7	4	46	43	0	93	124
07:15 AM	14	0	0	0	14	1	9	0	2	12	1	0	3	1	5	1	36	90	0	127	158
07:30 AM	20	1	1	0	22	0	13	0	2	15	1	0	5	0	6	3	50	137	0	190	233
07:45 AM	31	0	0	0	31	0	15	0	0	15	0	0	6	1	7	5	79	142	0	226	279
Total	77	1	1	0	79	1	48	0	5	54	3	0	19	3	25	13	211	412	0	636	794
08:00 AM	24	0	0	0	24	1	17	1	1	20	4	1	6	2	13	5	54	99	1	159	216
08:15 AM	18	0	1	0	19	0	13	0	0	13	1	1	6	1	9	3	74	92	0	169	210
08:30 AM	18	0	0	1	19	0	20	1	0	21	2	1	4	1	8	4	52	72	0	128	176
08:45 AM	15	0	1	0	16	0	19	1	3	23	1	2	11	2	16	1	56	74	0	131	186
Total	75	0	2	1	78	1	69	3	4	77	8	5	27	6	46	13	236	337	1	587	788
Grand Total	152	1	3	1	157	2	117	3	9	131	11	5	46	9	71	26	447	749	1	1223	1582
Apprch %	96.8	0.6	1.9	0.6		1.5	89.3	2.3	6.9		15.5	7	64.8	12.7		2.1	36.5	61.2	0.1		
Total %	9.6	0.1	0.2	0.1	9.9	0.1	7.4	0.2	0.6	8.3	0.7	0.3	2.9	0.6	4.5	1.6	28.3	47.3	0.1	77.3	
Lights	126	1	3	1	131	2	108	3	9	122	11	5	46	9	71	26	425	711	1	1163	1487
% Lights	82.9	100	100	100	83.4	100	92.3	100	100	93.1	100	100	100	100	100	100	95.1	94.9	100	95.1	94
Buses	17	0	0	0	17	0	5	0	0	5	0	0	0	0	0	0	9	29	0	38	60
% Buses	11.2	0	0	0	10.8	0	4.3	0	0	3.8	0	0	0	0	0	0	2	3.9	0	3.1	3.8
Trucks	9	0	0	0	9	0	4	0	0	4	0	0	0	0	0	0	13	9	0	22	35
% Trucks	5.9	0	0	0	5.7	0	3.4	0	0	3.1	0	0	0	0	0	0	2.9	1.2	0	1.8	2.2

	HAGAR DR Southbound				COOLIDGE DR Westbound				HAGAR CT Northbound				COOLIDGE DR Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	20	**1**	**1**	22	0	13	0	13	1	0	5	6	3	50	137	190	231
07:45 AM	**31**	0	0	**31**	0	15	0	15	0	0	**6**	6	**5**	**79**	**142**	**226**	**278**
08:00 AM	24	0	0	24	**1**	**17**	**1**	**19**	**4**	**1**	6	**11**	5	54	99	158	212
08:15 AM	18	0	1	19	0	13	0	13	1	1	6	8	3	74	92	169	209
Total Volume	93	1	2	96	1	58	1	60	6	2	23	31	16	257	470	743	930
% App. Total	96.9	1	2.1		1.7	96.7	1.7		19.4	6.5	74.2		2.2	34.6	63.3		
PHF	.750	.250	.500	.774	.250	.853	.250	.789	.375	.500	.958	.705	.800	.813	.827	.822	.836

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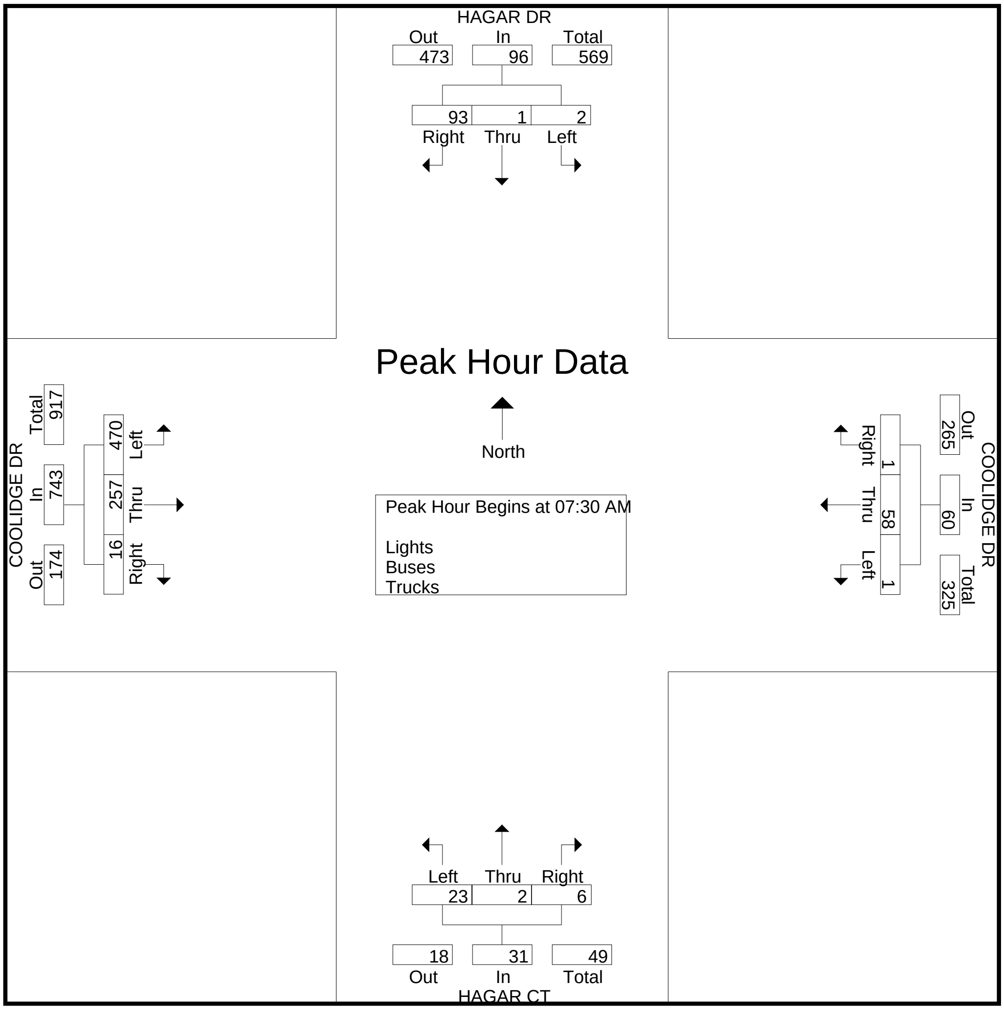

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Groups Printed- Lights - Buses - Trucks

	HAGAR DR Southbound					COOLIDGE DR Westbound					HAGAR CT Northbound					COOLIDGE DR Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	62	0	0	0	62	0	46	2	3	51	0	0	3	2	5	7	20	41	0	68	186
04:15 PM	68	0	1	1	70	0	36	2	2	40	1	0	4	2	7	4	22	42	0	68	185
04:30 PM	99	0	0	0	99	2	60	0	4	66	1	1	4	1	7	3	38	63	0	104	276
04:45 PM	113	0	0	1	114	1	70	3	2	76	2	1	7	4	14	11	39	96	0	146	350
Total	342	0	1	2	345	3	212	7	11	233	4	2	18	9	33	25	119	242	0	386	997
05:00 PM	153	0	0	0	153	0	73	5	4	82	1	1	6	4	12	11	52	92	0	155	402
05:15 PM	138	1	0	0	139	2	71	5	0	78	0	1	3	0	4	5	29	65	0	99	320
05:30 PM	84	0	0	0	84	1	37	0	2	40	0	1	7	0	8	13	30	53	0	96	228
05:45 PM	64	1	0	0	65	0	41	3	1	45	0	0	2	2	4	3	17	42	0	62	176
Total	439	2	0	0	441	3	222	13	7	245	1	3	18	6	28	32	128	252	0	412	1126
Grand Total	781	2	1	2	786	6	434	20	18	478	5	5	36	15	61	57	247	494	0	798	2123
Apprch %	99.4	0.3	0.1	0.3		1.3	90.8	4.2	3.8		8.2	8.2	59	24.6		7.1	31	61.9	0		
Total %	36.8	0.1	0	0.1	37	0.3	20.4	0.9	0.8	22.5	0.2	0.2	1.7	0.7	2.9	2.7	11.6	23.3	0	37.6	
Lights	751	1	1	2	755	6	434	19	18	477	5	5	36	15	61	57	246	461	0	764	2057
% Lights	96.2	50	100	100	96.1	100	100	95	100	99.8	100	100	100	100	100	100	99.6	93.3	0	95.7	96.9
Buses	28	1	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	32	0	32	61
% Buses	3.6	50	0	0	3.7	0	0	0	0	0	0	0	0	0	0	0	0	6.5	0	4	2.9
Trucks	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	0	1	1	0	2	5
% Trucks	0.3	0	0	0	0.3	0	0	5	0	0.2	0	0	0	0	0	0	0.4	0.2	0	0.3	0.2

	HAGAR DR Southbound				COOLIDGE DR Westbound				HAGAR CT Northbound				COOLIDGE DR Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	99	0	0	99	**2**	60	0	62	1	**1**	4	6	3	38	63	104	271
04:45 PM	113	0	0	113	1	70	3	74	**2**	1	**7**	**10**	**11**	39	**96**	146	343
05:00 PM	**153**	0	0	**153**	0	**73**	**5**	**78**	1	1	6	8	11	**52**	92	**155**	**394**
05:15 PM	138	**1**	0	139	2	71	5	78	0	1	3	4	5	29	65	99	320
Total Volume	503	1	0	504	5	274	13	292	4	4	20	28	30	158	316	504	1328
% App. Total	99.8	0.2	0		1.7	93.8	4.5		14.3	14.3	71.4		6	31.3	62.7		
PHF	.822	.250	.000	.824	.625	.938	.650	.936	.500	1.00	.714	.700	.682	.760	.823	.813	.843

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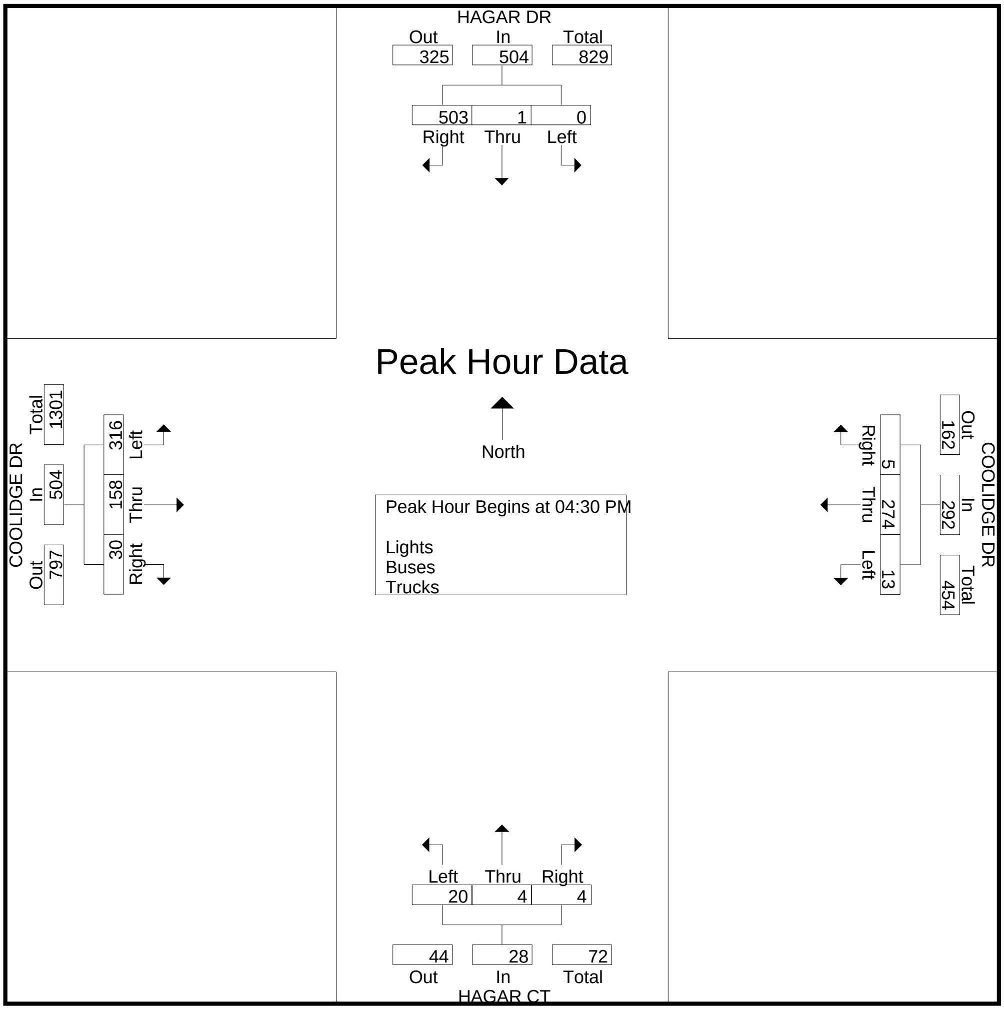


ATTACHMENT B. LOS RESULTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	470	257	16	1	58	1	23	2	6	2	1	93
Future Volume (veh/h)	470	257	16	1	58	1	23	2	6	2	1	93
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	0.98		0.97	0.98		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1759	1759	1900	1900	1900	1900	1900	1638	1900
Adj Flow Rate, veh/h	560	306	18	1	69	0	27	2	1	2	1	10
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4	8	8	8	0	0	0	16	16	16
Cap, veh/h	756	884	52	5	149	0	302	7	4	138	10	79
Arrive On Green	0.43	0.52	0.52	0.00	0.08	0.00	0.07	0.07	0.07	0.07	0.07	0.07
Sat Flow, veh/h	1740	1706	100	1675	1759	0	1323	98	49	191	134	1083
Grp Volume(v), veh/h	560	0	324	1	69	0	30	0	0	13	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	1806	1675	1759	0	1470	0	0	1408	0	0
Q Serve(g_s), s	9.0	0.0	3.5	0.0	1.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.0	0.0	3.5	0.0	1.2	0.0	0.6	0.0	0.0	0.3	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.00	0.90		0.03	0.15		0.77
Lane Grp Cap(c), veh/h	756	0	937	5	149	0	313	0	0	228	0	0
V/C Ratio(X)	0.74	0.00	0.35	0.20	0.46	0.00	0.10	0.00	0.00	0.06	0.00	0.00
Avail Cap(c_a), veh/h	1562	0	2973	1504	2896	0	1491	0	0	1356	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.9	0.0	4.7	16.6	14.6	0.0	14.6	0.0	0.0	14.5	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.8	7.0	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	1.9	0.0	0.9	0.0	0.3	0.0	0.0	0.1	0.0	0.0
LnGrp Delay(d),s/veh	8.4	0.0	5.5	23.7	22.4	0.0	14.7	0.0	0.0	14.5	0.0	0.0
LnGrp LOS	A		A	C	C		B			B		
Approach Vol, veh/h		884			70			30			13	
Approach Delay, s/veh		7.4			22.5			14.7			14.5	
Approach LOS		A			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.0	22.9		6.5	18.5	8.4		6.5
Change Period (Y+Rc), s	4.0	5.6		4.0	4.0	5.6		4.0
Max Green Setting (Gmax), s	30.0	55.0		30.0	30.0	55.0		30.0
Max Q Clear Time (g_c+I1), s	2.0	5.5		2.3	11.0	3.2		2.6
Green Ext Time (p_c), s	0.0	7.2		0.0	3.6	1.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.7
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	316	158	30	13	274	5	20	4	4	0	1	503
Future Volume (veh/h)	316	158	30	13	274	5	20	4	4	0	1	503
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.97		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1900	1900	1900	1900	1900	1900	1900	1827	1900
Adj Flow Rate, veh/h	376	188	32	15	326	5	24	5	1	0	1	87
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	4	4	4	0	0	0	0	0	0	4	4	4
Cap, veh/h	486	887	151	27	599	9	214	36	4	0	2	197
Arrive On Green	0.28	0.59	0.59	0.02	0.32	0.32	0.13	0.13	0.13	0.00	0.13	0.13
Sat Flow, veh/h	1740	1514	258	1810	1865	29	652	270	32	0	17	1480
Grp Volume(v), veh/h	376	0	220	15	0	331	30	0	0	0	0	88
Grp Sat Flow(s),veh/h/ln	1740	0	1772	1810	0	1894	953	0	0	0	0	1498
Q Serve(g_s), s	10.1	0.0	3.0	0.4	0.0	7.3	0.4	0.0	0.0	0.0	0.0	2.8
Cycle Q Clear(g_c), s	10.1	0.0	3.0	0.4	0.0	7.3	3.1	0.0	0.0	0.0	0.0	2.8
Prop In Lane	1.00		0.15	1.00		0.02	0.80		0.03	0.00		0.99
Lane Grp Cap(c), veh/h	486	0	1038	27	0	609	254	0	0	0	0	199
V/C Ratio(X)	0.77	0.00	0.21	0.55	0.00	0.54	0.12	0.00	0.00	0.00	0.00	0.44
Avail Cap(c_a), veh/h	1023	0	1911	1064	0	2042	880	0	0	0	0	881
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	16.9	0.0	5.0	25.0	0.0	14.2	20.2	0.0	0.0	0.0	0.0	20.4
Incr Delay (d2), s/veh	1.0	0.0	0.4	6.4	0.0	2.7	0.1	0.0	0.0	0.0	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	1.6	0.3	0.0	4.2	0.4	0.0	0.0	0.0	0.0	1.2
LnGrp Delay(d),s/veh	17.9	0.0	5.4	31.3	0.0	17.0	20.2	0.0	0.0	0.0	0.0	21.0
LnGrp LOS	B		A	C		B	C					C
Approach Vol, veh/h		596			346			30			88	
Approach Delay, s/veh		13.3			17.6			20.2			21.0	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.8	35.5		10.8	18.2	22.0		10.8
Change Period (Y+Rc), s	4.0	5.6		4.0	4.0	5.6		4.0
Max Green Setting (Gmax), s	30.0	55.0		30.0	30.0	55.0		30.0
Max Q Clear Time (g_c+I1), s	2.4	5.0		4.8	12.1	9.3		5.1
Green Ext Time (p_c), s	0.0	4.6		0.5	2.1	7.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.5
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	500	280	20	10	70	10	30	10	10	10	10	100
Future Volume (veh/h)	500	280	20	10	70	10	30	10	10	10	10	100
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	0.99		0.96	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1759	1759	1900	1900	1900	1900	1900	1638	1900
Adj Flow Rate, veh/h	543	304	21	11	76	6	33	11	3	11	11	12
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	8	8	8	0	0	0	16	16	16
Cap, veh/h	725	841	58	19	151	12	272	56	11	169	64	54
Arrive On Green	0.42	0.50	0.50	0.01	0.09	0.09	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1740	1686	116	1675	1607	127	937	528	100	324	600	504
Grp Volume(v), veh/h	543	0	325	11	0	82	47	0	0	34	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	1803	1675	0	1733	1565	0	0	1429	0	0
Q Serve(g_s), s	9.4	0.0	3.9	0.2	0.0	1.6	0.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.4	0.0	3.9	0.2	0.0	1.6	0.9	0.0	0.0	0.7	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.07	0.70		0.06	0.32		0.35
Lane Grp Cap(c), veh/h	725	0	899	19	0	163	339	0	0	286	0	0
V/C Ratio(X)	0.75	0.00	0.36	0.57	0.00	0.50	0.14	0.00	0.00	0.12	0.00	0.00
Avail Cap(c_a), veh/h	1472	0	2795	1417	0	2688	1446	0	0	1313	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.8	0.0	5.4	17.4	0.0	15.3	14.5	0.0	0.0	14.5	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.9	9.3	0.0	8.5	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	2.1	0.2	0.0	1.1	0.4	0.0	0.0	0.3	0.0	0.0
LnGrp Delay(d),s/veh	9.4	0.0	6.3	26.7	0.0	23.8	14.6	0.0	0.0	14.6	0.0	0.0
LnGrp LOS	A		A	C		C	B			B		
Approach Vol, veh/h		868			93			47			34	
Approach Delay, s/veh		8.2			24.2			14.6			14.6	
Approach LOS		A			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.4	23.3		7.8	18.8	8.9		7.8
Change Period (Y+Rc), s	4.0	5.6		4.0	4.0	5.6		4.0
Max Green Setting (Gmax), s	30.0	55.0		30.0	30.0	55.0		30.0
Max Q Clear Time (g_c+I1), s	2.2	5.9		2.7	11.4	3.6		2.9
Green Ext Time (p_c), s	0.0	7.2		0.1	3.4	1.5		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		10.1
HCM 2010 LOS		B

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	520	0	0	120
Future Vol, veh/h	0	0	520	0	0	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	565	0	0	130

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	695	565	0	-	-	-
Stage 1	565	-	-	-	-	-
Stage 2	130	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	408	524	-	0	0	-
Stage 1	569	-	-	0	0	-
Stage 2	896	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	408	524	-	-	-	-
Mov Cap-2 Maneuver	408	-	-	-	-	-
Stage 1	569	-	-	-	-	-
Stage 2	896	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	170	40	20	300	10	30	10	10	10	10	540
Future Volume (veh/h)	340	170	40	20	300	10	30	10	10	10	10	540
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.98		0.96	0.97		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1900	1900	1900	1900	1900	1900	1900	1827	1900
Adj Flow Rate, veh/h	370	185	40	22	326	10	33	11	3	11	11	94
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	0	0	0	0	0	0	4	4	4
Cap, veh/h	477	835	181	38	593	18	255	74	14	86	30	174
Arrive On Green	0.27	0.58	0.58	0.02	0.32	0.32	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1740	1448	313	1810	1832	56	979	528	103	73	217	1237
Grp Volume(v), veh/h	370	0	225	22	0	336	47	0	0	116	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	1760	1810	0	1888	1610	0	0	1527	0	0
Q Serve(g_s), s	10.2	0.0	3.2	0.6	0.0	7.6	0.0	0.0	0.0	0.1	0.0	0.0
Cycle Q Clear(g_c), s	10.2	0.0	3.2	0.6	0.0	7.6	1.2	0.0	0.0	3.6	0.0	0.0
Prop In Lane	1.00		0.18	1.00		0.03	0.70		0.06	0.09		0.81
Lane Grp Cap(c), veh/h	477	0	1016	38	0	611	344	0	0	290	0	0
V/C Ratio(X)	0.78	0.00	0.22	0.58	0.00	0.55	0.14	0.00	0.00	0.40	0.00	0.00
Avail Cap(c_a), veh/h	1005	0	1864	1045	0	1998	957	0	0	948	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.4	0.0	5.3	25.2	0.0	14.5	19.7	0.0	0.0	20.8	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.4	5.1	0.0	2.8	0.1	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	0.0	1.7	0.4	0.0	4.4	0.6	0.0	0.0	1.6	0.0	0.0
LnGrp Delay(d),s/veh	18.4	0.0	5.7	30.3	0.0	17.2	19.8	0.0	0.0	21.1	0.0	0.0
LnGrp LOS	B		A	C		B	B			C		
Approach Vol, veh/h		595			358			47			116	
Approach Delay, s/veh		13.6			18.0			19.8			21.1	
Approach LOS		B			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	35.6		11.3	18.2	22.4		11.3
Change Period (Y+Rc), s	4.0	5.6		4.0	4.0	5.6		4.0
Max Green Setting (Gmax), s	30.0	55.0		30.0	30.0	55.0		30.0
Max Q Clear Time (g_c+I1), s	2.6	5.2		5.6	12.2	9.6		3.2
Green Ext Time (p_c), s	0.0	4.7		0.7	2.1	7.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

Intersection						
Int Delay, s/veh	0					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	360	0	0	560
Future Vol, veh/h	0	0	360	0	0	560
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	391	0	0	609

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1000	391	0	-	-	-
Stage 1	391	-	-	-	-	-
Stage 2	609	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	270	658	-	0	0	-
Stage 1	683	-	-	0	0	-
Stage 2	543	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	270	658	-	-	-	-
Mov Cap-2 Maneuver	270	-	-	-	-	-
Stage 1	683	-	-	-	-	-
Stage 2	543	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	553	280	20	10	70	10	30	10	10	10	10	176
Future Volume (veh/h)	553	280	20	10	70	10	30	10	10	10	10	176
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.96	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1759	1759	1900	1900	1900	1900	1900	1638	1900
Adj Flow Rate, veh/h	601	304	21	11	76	4	33	11	3	11	11	23
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	8	8	8	0	0	0	16	16	16
Cap, veh/h	735	997	69	19	298	16	224	61	10	120	49	75
Arrive On Green	0.42	0.59	0.59	0.01	0.18	0.18	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1740	1686	116	1675	1655	87	890	594	101	218	477	727
Grp Volume(v), veh/h	601	0	325	11	0	80	47	0	0	45	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	1803	1675	0	1742	1585	0	0	1423	0	0
Q Serve(g_s), s	14.0	0.0	4.1	0.3	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	14.0	0.0	4.1	0.3	0.0	1.8	1.1	0.0	0.0	1.3	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.05	0.70		0.06	0.24		0.51
Lane Grp Cap(c), veh/h	735	0	1066	19	0	314	295	0	0	243	0	0
V/C Ratio(X)	0.82	0.00	0.30	0.58	0.00	0.26	0.16	0.00	0.00	0.19	0.00	0.00
Avail Cap(c_a), veh/h	1133	0	2152	1091	0	2078	1110	0	0	1002	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.7	0.0	4.7	22.7	0.0	16.2	19.0	0.0	0.0	19.1	0.0	0.0
Incr Delay (d2), s/veh	1.5	0.0	0.6	9.8	0.0	1.5	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	0.0	2.2	0.2	0.0	1.0	0.6	0.0	0.0	0.5	0.0	0.0
LnGrp Delay(d),s/veh	13.2	0.0	5.3	32.4	0.0	17.8	19.1	0.0	0.0	19.3	0.0	0.0
LnGrp LOS	B		A	C		B	B			B		
Approach Vol, veh/h		926			91			47			45	
Approach Delay, s/veh		10.4			19.5			19.1			19.3	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.5	32.8		8.7	23.5	13.9		8.7
Change Period (Y+Rc), s	4.0	5.6		4.0	4.0	5.6		4.0
Max Green Setting (Gmax), s	30.0	55.0		30.0	30.0	55.0		30.0
Max Q Clear Time (g_c+I1), s	2.3	6.1		3.3	16.0	3.8		3.1
Green Ext Time (p_c), s	0.0	9.0		0.3	3.4	9.1		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	11.9
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	76	36	520	53	5	120
Future Vol, veh/h	76	36	520	53	5	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	4	2	2	16
Mvmt Flow	83	39	565	58	5	130

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	735	594	0	0	623	0
Stage 1	594	-	-	-	-	-
Stage 2	141	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	387	505	-	-	958	-
Stage 1	552	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	385	505	-	-	958	-
Mov Cap-2 Maneuver	385	-	-	-	-	-
Stage 1	552	-	-	-	-	-
Stage 2	881	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.2	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	417	958	-
HCM Lane V/C Ratio	-	-	0.292	0.006	-
HCM Control Delay (s)	-	-	17.2	8.8	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			✥	
Traffic Volume (veh/h)	356	170	40	20	300	26	30	10	10	10	10	630
Future Volume (veh/h)	356	170	40	20	300	26	30	10	10	10	10	630
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.98		0.97	0.97		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1900	1900	1900	1900	1900	1900	1900	1827	1900
Adj Flow Rate, veh/h	387	185	39	22	326	25	33	11	4	11	11	149
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	0	0	0	0	0	0	4	4	4
Cap, veh/h	469	905	191	36	647	50	217	65	17	65	23	202
Arrive On Green	0.27	0.62	0.62	0.02	0.37	0.37	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	1740	1455	307	1810	1738	133	820	428	113	45	150	1327
Grp Volume(v), veh/h	387	0	224	22	0	351	48	0	0	171	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	1762	1810	0	1871	1361	0	0	1523	0	0
Q Serve(g_s), s	13.8	0.0	3.6	0.8	0.0	9.6	0.0	0.0	0.0	1.7	0.0	0.0
Cycle Q Clear(g_c), s	13.8	0.0	3.6	0.8	0.0	9.6	1.7	0.0	0.0	7.0	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.07	0.69		0.08	0.06		0.87
Lane Grp Cap(c), veh/h	469	0	1095	36	0	697	299	0	0	290	0	0
V/C Ratio(X)	0.83	0.00	0.20	0.60	0.00	0.50	0.16	0.00	0.00	0.59	0.00	0.00
Avail Cap(c_a), veh/h	791	0	1469	823	0	1560	710	0	0	745	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	22.7	0.0	5.4	32.1	0.0	16.0	24.4	0.0	0.0	26.7	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.3	5.9	0.0	2.0	0.1	0.0	0.0	0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	0.0	1.8	0.5	0.0	5.3	0.8	0.0	0.0	3.0	0.0	0.0
LnGrp Delay(d),s/veh	24.1	0.0	5.7	37.9	0.0	18.0	24.5	0.0	0.0	27.4	0.0	0.0
LnGrp LOS	C		A	D		B	C			C		
Approach Vol, veh/h		611			373			48			171	
Approach Delay, s/veh		17.4			19.2			24.5			27.4	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.3	46.6		14.0	21.8	30.2		14.0
Change Period (Y+Rc), s	4.0	5.6		4.0	4.0	5.6		4.0
Max Green Setting (Gmax), s	30.0	55.0		30.0	30.0	55.0		30.0
Max Q Clear Time (g_c+I1), s	2.8	5.6		9.0	15.8	11.6		3.7
Green Ext Time (p_c), s	0.0	13.6		1.2	2.0	13.0		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	4.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	90	0	360	32	96	560
Future Vol, veh/h	90	0	360	32	96	560
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	4	2	2	4
Mvmt Flow	98	0	391	35	104	609

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1226	409	0	0	426	0
Stage 1	409	-	-	-	-	-
Stage 2	817	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	197	642	-	-	1133	-
Stage 1	671	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	170	642	-	-	1133	-
Mov Cap-2 Maneuver	170	-	-	-	-	-
Stage 1	671	-	-	-	-	-
Stage 2	374	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	51.5	0	1.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	170	1133	-
HCM Lane V/C Ratio	-	-	0.575	0.092	-
HCM Control Delay (s)	-	-	51.5	8.5	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	3	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	553	280	20	10	70	10	30	10	10	10	10	176
Future Volume (veh/h)	553	280	20	10	70	10	30	10	10	10	10	176
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.98		0.96	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1759	1759	1900	1900	1900	1900	1900	1638	1900
Adj Flow Rate, veh/h	601	304	21	11	76	4	33	11	3	11	11	23
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	8	8	8	0	0	0	16	16	16
Cap, veh/h	733	995	69	19	297	16	226	62	11	119	51	77
Arrive On Green	0.42	0.59	0.59	0.01	0.18	0.18	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1740	1686	116	1675	1655	87	891	583	101	212	482	725
Grp Volume(v), veh/h	601	0	325	11	0	80	47	0	0	45	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	1803	1675	0	1742	1575	0	0	1418	0	0
Q Serve(g_s), s	14.2	0.0	4.2	0.3	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	14.2	0.0	4.2	0.3	0.0	1.8	1.1	0.0	0.0	1.3	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.05	0.70		0.06	0.24		0.51
Lane Grp Cap(c), veh/h	733	0	1063	19	0	313	299	0	0	247	0	0
V/C Ratio(X)	0.82	0.00	0.31	0.58	0.00	0.26	0.16	0.00	0.00	0.18	0.00	0.00
Avail Cap(c_a), veh/h	1123	0	2134	1082	0	2062	1096	0	0	991	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.9	0.0	4.8	22.9	0.0	16.4	19.0	0.0	0.0	19.1	0.0	0.0
Incr Delay (d2), s/veh	1.6	0.0	0.6	9.8	0.0	1.5	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	0.0	2.2	0.2	0.0	1.0	0.6	0.0	0.0	0.5	0.0	0.0
LnGrp Delay(d),s/veh	13.5	0.0	5.4	32.6	0.0	17.9	19.1	0.0	0.0	19.3	0.0	0.0
LnGrp LOS	B		A	C		B	B			B		
Approach Vol, veh/h		926			91			47			45	
Approach Delay, s/veh		10.6			19.7			19.1			19.3	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.5	33.0		8.9	23.6	13.9		8.9
Change Period (Y+Rc), s	4.0	5.6		4.0	4.0	5.6		4.0
Max Green Setting (Gmax), s	30.0	55.0		30.0	30.0	55.0		30.0
Max Q Clear Time (g_c+I1), s	2.3	6.2		3.3	16.2	3.8		3.1
Green Ext Time (p_c), s	0.0	9.0		0.3	3.4	9.1		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	12.1
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	76	36	520	52	5	120
Future Vol, veh/h	76	36	520	52	5	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	4	2	2	16
Mvmt Flow	83	39	565	57	5	130

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	734	593	0	0	622	0
Stage 1	593	-	-	-	-	-
Stage 2	141	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	387	506	-	-	959	-
Stage 1	552	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	385	506	-	-	959	-
Mov Cap-2 Maneuver	385	-	-	-	-	-
Stage 1	552	-	-	-	-	-
Stage 2	881	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.2	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	417	959	-
HCM Lane V/C Ratio	-	-	0.292	0.006	-
HCM Control Delay (s)	-	-	17.2	8.8	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	356	170	40	20	300	26	30	10	10	10	10	630
Future Volume (veh/h)	356	170	40	20	300	26	30	10	10	10	10	630
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.98		0.97	0.97		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1900	1900	1900	1900	1900	1900	1900	1827	1900
Adj Flow Rate, veh/h	387	185	39	22	326	25	33	11	4	11	11	153
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	0	0	0	0	0	0	4	4	4
Cap, veh/h	468	902	190	36	645	49	217	65	17	64	23	206
Arrive On Green	0.27	0.62	0.62	0.02	0.37	0.37	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	1740	1455	307	1810	1738	133	807	420	112	44	147	1332
Grp Volume(v), veh/h	387	0	224	22	0	351	48	0	0	175	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	1762	1810	0	1871	1339	0	0	1523	0	0
Q Serve(g_s), s	13.9	0.0	3.7	0.8	0.0	9.6	0.0	0.0	0.0	1.7	0.0	0.0
Cycle Q Clear(g_c), s	13.9	0.0	3.7	0.8	0.0	9.6	1.8	0.0	0.0	7.2	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.07	0.69		0.08	0.06		0.87
Lane Grp Cap(c), veh/h	468	0	1093	36	0	695	299	0	0	294	0	0
V/C Ratio(X)	0.83	0.00	0.21	0.61	0.00	0.51	0.16	0.00	0.00	0.60	0.00	0.00
Avail Cap(c_a), veh/h	786	0	1460	818	0	1550	702	0	0	741	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	22.8	0.0	5.5	32.3	0.0	16.2	24.4	0.0	0.0	26.7	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.3	5.9	0.0	2.1	0.1	0.0	0.0	0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	0.0	1.8	0.5	0.0	5.4	0.8	0.0	0.0	3.1	0.0	0.0
LnGrp Delay(d),s/veh	24.3	0.0	5.8	38.2	0.0	18.2	24.5	0.0	0.0	27.5	0.0	0.0
LnGrp LOS	C		A	D		B	C			C		
Approach Vol, veh/h		611			373			48			175	
Approach Delay, s/veh		17.5			19.4			24.5			27.5	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.3	46.8		14.3	21.9	30.2		14.3
Change Period (Y+Rc), s	4.0	5.6		4.0	4.0	5.6		4.0
Max Green Setting (Gmax), s	30.0	55.0		30.0	30.0	55.0		30.0
Max Q Clear Time (g_c+I1), s	2.8	5.7		9.2	15.9	11.6		3.8
Green Ext Time (p_c), s	0.0	13.6		1.2	2.0	13.0		1.3

Intersection Summary			
HCM 2010 Ctrl Delay			19.8
HCM 2010 LOS			B

Intersection	
Int Delay, s/veh	4.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	90	0	360	32	96	560
Future Vol, veh/h	90	0	360	32	96	560
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	4	2	2	4
Mvmt Flow	98	0	391	35	104	609

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1226	409	0	0	426	0
Stage 1	409	-	-	-	-	-
Stage 2	817	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	197	642	-	-	1133	-
Stage 1	671	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	170	642	-	-	1133	-
Mov Cap-2 Maneuver	170	-	-	-	-	-
Stage 1	671	-	-	-	-	-
Stage 2	374	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	51.5	0	1.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	170	1133	-
HCM Lane V/C Ratio	-	-	0.575	0.092	-
HCM Control Delay (s)	-	-	51.5	8.5	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	3	0.3	-

ATTACHMENT C. TRIP GENERATION FOR PROPOSED CHILDCARE CENTER

TABLE C 1: ADJUSTED CHILDCARE CENTER TRIP RATES

Children Type	Enrollment or Employees	Mode Share for Vehicles	Drop-off and Pick-up During Peak Hour[1]	Daily		AM Peak Hour				PM Peak Hour			
				Enrollment	Total	Enrollment	Total	In	Out	Enrollment	Total	In	Out
ITE Trip Rates													
ITE LU 565: Day Care Center (per student)		100%	-	140	4.090	112	0.780	0.413	0.367	140	0.790	0.371	0.419
Adjusted Enrollement & Vehicle Trip Rates[2]													
Children of Students													
Living on Hagar Site	49	0%	50%	49	0.00	39	0.00	0.00	0.00	49	0.00	0.00	0.00
Living off-campus	11	100%	50%	11	4.00	9	1.00	0.50	0.50	11	1.00	0.50	0.50
Children of Employees													
Living on-campus	48	50%	50%	48	2.05	38	0.50	0.25	0.25	48	0.50	0.25	0.25
Living off-campus	32	100%	50%	32	4.09	26	1.00	0.50	0.50	32	1.00	0.50	0.50
Employees													
Childcare Center Employees	30	-	-		1.36		0.08	0.06	0.02		0.11	0.04	0.07
Total	**140**	**-**	**-**	**140**	**-**	**112**	**-**	**-**	**-**	**140**	**-**	**-**	**-**

TABLE C2: PROPOSED CHILDCARE CENTER TRIP GENERATION

Children Type	Enrollment or Employees	Mode Share for Vehicles	Drop-off and Pick-up During Peak Hour[1]	Daily		AM Peak Hour				PM Peak Hour			
				Enrollment	Total	Enrollment	Total	In	Out	Enrollment	Total	In	Out
Children of Students													
Living on Hagar Site	49	0%	50%	49	0	39	0	0	0	49	0	0	0
Living off-campus	11	100%	50%	11	44	9	10	5	5	11	12	6	6
Children of Employees													
Living on-campus	48	50%	50%	48	98	38	20	10	10	48	24	12	12
Living off-campus	32	100%	50%	32	131	26	26	13	13	32	32	16	16
Employees													
Childcare Center Employees	30	-	-	30	41	30	3	2	1	30	3	1	2
Total Trip Generation for Childcare Center	***140***	***-***	***-***	***140***	***314***	***112***	***59***	***30***	***29***	***140***	***71***	***35***	***36***

Note:

1. This analysis assumes that 50% of kids would be dropped off/picked up during peak hours; and the remaining 50% would be dropped off/picked up outside of the peak hours.
2. Base trip rates for childcare center kids: 4 trips per kid per day (2 inbound and 2 outbound); 2 trips per kid (1 inbound and 1 outbound) during the drop-off and pick-up times.
   Trip rates for employees are based on campus-wide vehicle trip generation rates for employees, derived from 2016 driveway counts.

ATTACHMENT D. CA MUTCD SIGNAL WARRANT 3A AND 3B PEAK HOUR ANALYSIS OF HAGAR DRIVE / PROJECT DRIVEWAY IN THE PM PEAK HOUR

FEHR PEERS

Major Street	Hagar Drive		Project	UCSC West Campus Housing
Minor Street	Driveway 1		Scenario	Existing
			Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	0	0	90
Through	360	560	0	0
Right	32	0	0	0
Total	392	560	0	90

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	51.5
Approach with Worst Case Delay	WB
Total Vehicles on Approach	90

Warrant 3A, Peak Hour

	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced (vph)
Existing	**1.3**	**90**	**1,042**
Limiting Value	**4**	**100**	**650**
Condition Satisfied?	**Not Met**	**Not Met**	**Met**
Warrant Met	**NO**		

FEHR & PEERS

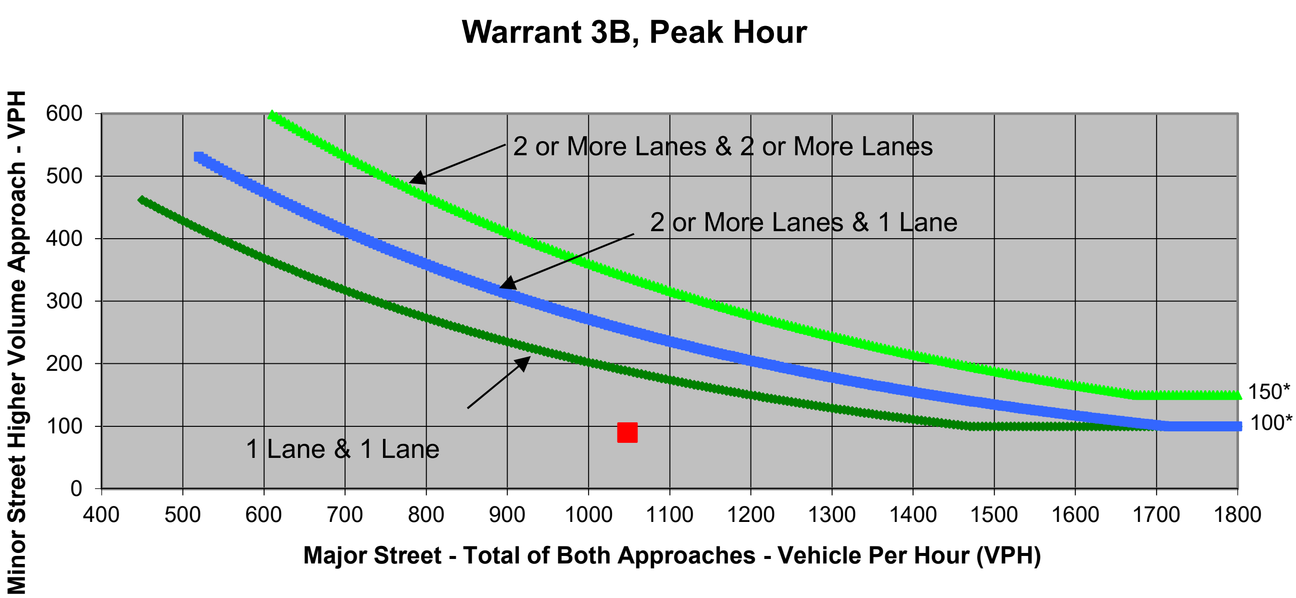
			Project	UCSC West Campus Housing
Major Street	Hagar Drive		Scenario	Existing
Minor Street	Driveway 1		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	96	0	90
Through	360	560	0	0
Right	32	0	0	0
Total	392	656	0	90

Major Street Direction

x	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street Hagar Drive	Minor Street Driveway 1	Warrant Met
Number of Approach Lanes	**2**	**1**	**NO**
Traffic Volume (VPH) *	**1,048**	**90**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

ATTACHMENT E. LOS RESULTS FOR TWO DRIVEWAYS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	554	280	20	10	172	10	30	10	10	10	10	100
Future Volume (veh/h)	554	280	20	10	172	10	30	10	10	10	10	100
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.96	0.96		0.95	0.96		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1900	1900	1900	1900	1900	1900	1900	1827	1900
Adj Flow Rate, veh/h	602	304	21	11	187	9	33	11	3	11	11	11
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	0	0	0	0	0	0	4	4	4
Cap, veh/h	679	1120	77	20	513	25	197	56	11	107	85	58
Arrive On Green	0.39	0.66	0.66	0.01	0.29	0.29	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1740	1686	116	1810	1795	86	912	516	97	284	777	531
Grp Volume(v), veh/h	602	0	325	11	0	196	47	0	0	33	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	1802	1810	0	1881	1526	0	0	1592	0	0
Q Serve(g_s), s	20.4	0.0	4.7	0.4	0.0	5.3	0.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.4	0.0	4.7	0.4	0.0	5.3	1.6	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.05	0.70		0.06	0.33		0.33
Lane Grp Cap(c), veh/h	679	0	1198	20	0	537	264	0	0	250	0	0
V/C Ratio(X)	0.89	0.00	0.27	0.55	0.00	0.36	0.18	0.00	0.00	0.13	0.00	0.00
Avail Cap(c_a), veh/h	826	0	1569	859	0	1637	799	0	0	803	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.0	0.0	4.3	31.1	0.0	18.0	25.7	0.0	0.0	25.6	0.0	0.0
Incr Delay (d2), s/veh	8.9	0.0	0.4	8.3	0.0	1.5	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.4	0.0	2.4	0.2	0.0	2.9	0.8	0.0	0.0	0.5	0.0	0.0
LnGrp Delay(d),s/veh	26.9	0.0	4.8	39.4	0.0	19.5	25.9	0.0	0.0	25.7	0.0	0.0
LnGrp LOS	C		A	D		B	C			C		
Approach Vol, veh/h		927			207			47			33	
Approach Delay, s/veh		19.1			20.6			25.9			25.7	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.7	47.6		10.9	28.6	23.6		10.9
Change Period (Y+Rc), s	4.0	5.6		4.0	4.0	5.6		4.0
Max Green Setting (Gmax), s	30.0	55.0		30.0	30.0	55.0		30.0
Max Q Clear Time (g_c+I1), s	2.4	6.7		3.1	22.4	7.3		3.6
Green Ext Time (p_c), s	0.0	11.4		0.2	2.3	11.4		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	19.8
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	10	520	54	0	120
Future Vol, veh/h	0	10	520	54	0	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	4	2	2	4
Mvmt Flow	0	11	565	59	0	130

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	595	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	504	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	504	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	504	-
HCM Lane V/C Ratio	-	-	0.022	-
HCM Control Delay (s)	-	-	12.3	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	300	90	3	0	102
Future Vol, veh/h	0	300	90	3	0	102
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	326	98	3	0	111

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	99
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	957
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	957
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	957
HCM Lane V/C Ratio	-	-	-	0.116
HCM Control Delay (s)	-	-	-	9.3
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	356	170	40	20	380	10	30	10	10	10	10	540
Future Volume (veh/h)	356	170	40	20	380	10	30	10	10	10	10	540
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.95		0.95	0.96		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1900	1900	1900	1900	1900	1900	1900	1827	1900
Adj Flow Rate, veh/h	387	185	39	22	413	10	33	11	3	11	11	0
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	0	0	0	0	0	0	4	4	4
Cap, veh/h	468	977	206	36	779	19	186	53	10	139	108	0
Arrive On Green	0.27	0.67	0.67	0.02	0.42	0.42	0.10	0.10	0.10	0.10	0.10	0.00
Sat Flow, veh/h	1740	1455	307	1810	1846	45	906	516	97	560	1046	0
Grp Volume(v), veh/h	387	0	224	22	0	423	47	0	0	22	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	1762	1810	0	1890	1519	0	0	1606	0	0
Q Serve(g_s), s	13.8	0.0	3.2	0.8	0.0	11.0	0.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	13.8	0.0	3.2	0.8	0.0	11.0	1.7	0.0	0.0	0.7	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.02	0.70		0.06	0.50		0.00
Lane Grp Cap(c), veh/h	468	0	1183	36	0	798	249	0	0	247	0	0
V/C Ratio(X)	0.83	0.00	0.19	0.60	0.00	0.53	0.19	0.00	0.00	0.09	0.00	0.00
Avail Cap(c_a), veh/h	789	0	1465	820	0	1571	764	0	0	782	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	22.7	0.0	4.1	32.2	0.0	14.2	27.3	0.0	0.0	26.9	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.3	5.9	0.0	2.0	0.1	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	0.0	1.6	0.5	0.0	6.2	0.8	0.0	0.0	0.4	0.0	0.0
LnGrp Delay(d),s/veh	24.2	0.0	4.4	38.0	0.0	16.2	27.5	0.0	0.0	27.0	0.0	0.0
LnGrp LOS	C		A	D		B	C			C		
Approach Vol, veh/h		611			445			47			22	
Approach Delay, s/veh		16.9			17.3			27.5			27.0	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.3	50.0		10.8	21.8	33.5		10.8
Change Period (Y+Rc), s	4.0	5.6		4.0	4.0	5.6		4.0
Max Green Setting (Gmax), s	30.0	55.0		30.0	30.0	55.0		30.0
Max Q Clear Time (g_c+I1), s	2.8	5.2		2.7	15.8	13.0		3.7
Green Ext Time (p_c), s	0.0	15.9		0.1	2.0	14.9		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	17.7
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	10	360	16	0	560
Future Vol, veh/h	0	10	360	16	0	560
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	4	2	2	4
Mvmt Flow	0	11	391	17	0	609

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	400	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	650	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	650	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	650	-
HCM Lane V/C Ratio	-	-	0.017	-
HCM Control Delay (s)	-	-	10.6	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	190	330	112	0	80
Future Vol, veh/h	0	190	330	112	0	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	207	359	122	0	87

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	420
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	633
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	633
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	633
HCM Lane V/C Ratio	-	-	-	0.137
HCM Control Delay (s)	-	-	-	11.6
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	554	280	20	10	172	10	30	10	10	10	10	100
Future Volume (veh/h)	554	280	20	10	172	10	30	10	10	10	10	100
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.98		0.95	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1759	1759	1900	1900	1900	1900	1900	1638	1900
Adj Flow Rate, veh/h	602	304	21	11	187	9	33	11	3	11	11	11
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	8	8	8	0	0	0	16	16	16
Cap, veh/h	683	1151	80	19	500	24	178	50	9	102	59	42
Arrive On Green	0.39	0.68	0.68	0.01	0.30	0.30	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1740	1686	117	1675	1663	80	904	562	100	288	670	479
Grp Volume(v), veh/h	602	0	325	11	0	196	47	0	0	33	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	1803	1675	0	1743	1566	0	0	1436	0	0
Q Serve(g_s), s	20.0	0.0	4.3	0.4	0.0	5.5	0.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.0	0.0	4.3	0.4	0.0	5.5	1.5	0.0	0.0	1.3	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.05	0.70		0.06	0.33		0.33
Lane Grp Cap(c), veh/h	683	0	1231	19	0	524	236	0	0	203	0	0
V/C Ratio(X)	0.88	0.00	0.26	0.59	0.00	0.37	0.20	0.00	0.00	0.16	0.00	0.00
Avail Cap(c_a), veh/h	838	0	1591	807	0	1539	820	0	0	746	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.6	0.0	3.8	30.7	0.0	17.2	26.6	0.0	0.0	26.5	0.0	0.0
Incr Delay (d2), s/veh	8.1	0.0	0.4	10.5	0.0	1.6	0.2	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.1	0.0	2.2	0.2	0.0	2.8	0.8	0.0	0.0	0.5	0.0	0.0
LnGrp Delay(d),s/veh	25.7	0.0	4.2	41.2	0.0	18.8	26.7	0.0	0.0	26.6	0.0	0.0
LnGrp LOS	C		A	D		B	C			C		
Approach Vol, veh/h		927			207			47			33	
Approach Delay, s/veh		18.2			20.0			26.7			26.6	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.7	48.1		9.5	28.5	24.3		9.5
Change Period (Y+Rc), s	4.0	5.6		4.0	4.0	5.6		4.0
Max Green Setting (Gmax), s	30.0	55.0		30.0	30.0	55.0		30.0
Max Q Clear Time (g_c+I1), s	2.4	6.3		3.3	22.0	7.5		3.5
Green Ext Time (p_c), s	0.0	12.0		0.2	2.5	11.9		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	19.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	10	520	54	0	120
Future Vol, veh/h	0	10	520	54	0	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	4	2	2	16
Mvmt Flow	0	11	565	59	0	130

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	595	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	504	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	504	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	504	-
HCM Lane V/C Ratio	-	-	0.022	-
HCM Control Delay (s)	-	-	12.3	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection						
Int Delay, s/veh	1.9					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↰			↱
Traffic Vol, veh/h	0	300	90	3	0	102
Future Vol, veh/h	0	300	90	3	0	102
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	326	98	3	0	111

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	99
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	957
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	957
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	957
HCM Lane V/C Ratio	-	-	-	0.116
HCM Control Delay (s)	-	-	-	9.3
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	356	170	40	20	380	10	30	10	10	10	10	540
Future Volume (veh/h)	356	170	40	20	380	10	30	10	10	10	10	540
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.97		0.96	0.96		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1827	1900	1900	1900	1900	1900	1900	1900	1900	1827	1900
Adj Flow Rate, veh/h	387	185	39	22	413	10	33	11	3	11	11	90
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	0	0	0	0	0	0	4	4	4
Cap, veh/h	465	965	203	36	767	19	208	61	12	67	26	144
Arrive On Green	0.27	0.66	0.66	0.02	0.42	0.42	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1740	1455	307	1810	1846	45	1006	519	104	77	221	1220
Grp Volume(v), veh/h	387	0	224	22	0	423	47	0	0	112	0	0
Grp Sat Flow(s),veh/h/ln	1740	0	1762	1810	0	1890	1628	0	0	1518	0	0
Q Serve(g_s), s	14.3	0.0	3.4	0.8	0.0	11.5	0.0	0.0	0.0	0.9	0.0	0.0
Cycle Q Clear(g_c), s	14.3	0.0	3.4	0.8	0.0	11.5	1.6	0.0	0.0	4.7	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.02	0.70		0.06	0.10		0.80
Lane Grp Cap(c), veh/h	465	0	1168	36	0	785	282	0	0	237	0	0
V/C Ratio(X)	0.83	0.00	0.19	0.61	0.00	0.54	0.17	0.00	0.00	0.47	0.00	0.00
Avail Cap(c_a), veh/h	765	0	1420	795	0	1523	733	0	0	718	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	23.6	0.0	4.4	33.2	0.0	15.0	27.2	0.0	0.0	28.6	0.0	0.0
Incr Delay (d2), s/veh	1.7	0.0	0.3	6.0	0.0	2.1	0.1	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.0	1.7	0.5	0.0	6.4	0.8	0.0	0.0	2.0	0.0	0.0
LnGrp Delay(d),s/veh	25.3	0.0	4.7	39.2	0.0	17.1	27.3	0.0	0.0	29.2	0.0	0.0
LnGrp LOS	C		A	D		B	C			C		
Approach Vol, veh/h		611			445			47			112	
Approach Delay, s/veh		17.7			18.2			27.3			29.2	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.4	50.8		12.0	22.2	34.0		12.0
Change Period (Y+Rc), s	4.0	5.6		4.0	4.0	5.6		4.0
Max Green Setting (Gmax), s	30.0	55.0		30.0	30.0	55.0		30.0
Max Q Clear Time (g_c+I1), s	2.8	5.4		6.7	16.3	13.5		3.6
Green Ext Time (p_c), s	0.0	15.9		0.7	1.9	14.9		0.8

Intersection Summary		
HCM 2010 Ctrl Delay		19.3
HCM 2010 LOS		B

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	10	360	16	0	560
Future Vol, veh/h	0	10	360	16	0	560
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	4	2	2	4
Mvmt Flow	0	11	391	17	0	609

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	400	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	650	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	650	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	650	-
HCM Lane V/C Ratio	-	-	0.017	-
HCM Control Delay (s)	-	-	10.6	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection						
Int Delay, s/veh	1.3					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↰			↱
Traffic Vol, veh/h	0	190	330	112	0	80
Future Vol, veh/h	0	190	330	112	0	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	207	359	122	0	87

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	420
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	633
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	633
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	633
HCM Lane V/C Ratio	-	-	-	0.137
HCM Control Delay (s)	-	-	-	11.6
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.5

APPENDIX 4.14

Construction Diesel and Petroleum Fuel Consumption Tables

Table 4.14-1
Off-Road Construction Equipment Diesel Fuel Consumption - Heller Site

Phase	Equipment Type	Units	Hours	Horse Power	Load Factor	Number of Days	Fuel Usage/ HP/hr	Diesel Usage (in gallons)
Demolition	Generator Sets	1	4.8	84	0.74	80	0.05	1,193
	Excavators	2	4.8	158	0.38	80	0.05	2,306
	Rubber Tired Dozers	2	4.8	203	0.36	80	0.05	2,806
	Signal Boards	1	8	6	0.82	80	0.05	157
	Sweepers/Scrubbers	1	2	64	0.42	80	0.05	215
Site Preparation	Crawler Tractors	2	5.6	212	0.43	20	0.05	1,021
	Excavators	2	5.6	158	0.38	20	0.05	672
	Generator Sets	1	5.6	84	0.74	20	0.05	348
	Graders	1	5.6	187	0.41	20	0.05	429
	Off-highway Tractors	1	5.6	124	0.44	20	0.05	306
	Off-highway Trucks	1	5.6	402	0.38	20	0.05	855
	Pumps	1	5.6	84	0.74	20	0.05	348
	Rubber Tired Loaders	1	5.6	203	0.36	20	0.05	409
	Scrapers	1	5.6	367	0.48	20	0.05	986
	Signal Boards	2	8.0	6	0.82	20	0.05	79
	Skid Steer Loaders	1	5.6	65	0.37	20	0.05	135
	Sweepers/Scrubbers	1	2.0	64	0.46	20	0.05	59
Grading	Crawler Tractors	4	5.60	212	0.43	45	0.05	4,594
	Excavators	4	5.60	158	0.38	45	0.05	3,026
	Generator Sets	1	5.60	84	0.74	45	0.05	783
	Graders	3	5.60	187	0.41	45	0.05	2,898
	Off-Highway Tractors	2	5.60	124	0.44	45	0.05	1,375
	Off-Highway Trucks	2	5.60	402	0.38	45	0.05	3,850
	Plate Compactors	6	5.60	8	0.43	45	0.05	260
	Pumps	2	5.60	84	0.74	45	0.05	1,566
	Rollers	2	5.60	80	0.38	45	0.05	766
	Rough Terrain Forklifts	1	5.60	100	0.40	45	0.05	504
	Rubber Tired Dozers	2	5.60	247	0.40	45	0.05	2,490
	Rubber Tired Loaders	3	5.60	247	0.40	45	0.05	3,735
	Scrapers	3	5.60	367	0.48	45	0.05	6,659
	Signal Boards	6	8.00	6	0.82	45	0.05	531
	Skid Steer Loaders	2	5.60	65	0.37	45	0.05	606
	Sweepers/Scrubbers	2	2.00	64	0.46	45	0.05	265
Building Construction	Aerial Lifts	12	3.20	63	0.31	440	0.05	16,499
	Air Compressors	6	3.20	78	0.48	440	0.05	15,815
	Concrete/Industrial Saws	4	3.20	81	0.73	440	0.05	16,651
	Cranes	3	3.20	231	0.29	440	0.05	14,148

Phase	Equipment Type	Units	Hours	Horse Power	Load Factor	Number of Days	Fuel Usage/ HP/hr	Diesel Usage (in gallons)
	Forklifts	2	3.20	89	0.20	440	0.05	2,506
	Generator Sets	4	3.20	84	0.74	440	0.05	17,504
	Other Construction Equipment	6	3.20	172	0.42	440	0.05	30,514
	Pressure Washers	1	3.20	13	0.30	440	0.05	275
	Pumps	2	3.20	84	0.74	440	0.05	8,752
	Rough Terrain Forklifts	4	3.20	100	0.40	440	0.05	11,264
	Signal Boards	4	8.00	6	0.82	440	0.05	3,464
	Skid Steer Loaders	2	3.20	65	0.37	440	0.05	3,386
	Sweepers/Scrubbers	1	2.00	64	0.46	440	0.05	1,295
Paving	Pavers	1	5.60	130	0.42	15	0.05	229
	Paving Equipment	1	5.60	132	0.36	15	0.05	200
	Plate Compactors	2	5.60	8	0.43	15	0.05	29
	Rollers	1	5.60	80	0.38	15	0.05	128
	Rubber Tired Loaders	1	5.60	203	0.36	15	0.05	307
	Signal Boards	2	8.00	6	0.82	15	0.05	59
	Skid Steer Loaders	1	5.60	65	0.37	15	0.05	101
	Sweepers/Scrubbers	1	2.00	64	0.46	15	0.05	44
	Graders	1	5.6	187	0.41	15	0.05	322
Architectural Coating	Aerial Lifts	8	1.20	63	0.31	250	0.05	2,343
	Air Compressors	2	1.20	78	0.48	250	0.05	1,123
	Cement and Mortar Mixers	6	1.20	9	0.56	250	0.05	454
	Cranes	1	1.20	231	0.29	250	0.05	1,005
	Generator Sets	2	1.20	84	0.74	250	0.05	1,865
	Other Construction Equipment	2	1.20	172	0.42	250	0.05	2,167
	Pressure Washers	1	1.20	13	0.30	250	0.05	59
	Rough Terrain Forklifts	2	1.20	100	0.40	250	0.05	1,200
	Graders	1	5.6	187	0.41	250	0.05	5,367
							Heller Site Total	**205,307**

Source: Construction Schedule in Appendix 4.2; Illingwoth and Rodkin, 2018.

Table 4.14-2
Off-Road Construction Equipment Diesel Fuel Consumption - Hagar Site

Phase	Equipment Type	Units	Hours	Horse Power	Load Factor	Number of Days	Fuel Usage/ HP/hr	Diesel Usage (in gallons)
Residential								
Site Preparation	Crawler Tractors	1	5.60	212	0.43	10	0.05	255
	Excavators	1	5.60	158	0.38	10	0.05	168
	Generator Sets	1	5.60	84	0.74	10	0.05	174
	Off-Highway Tractors	1	5.60	124	0.44	10	0.05	153
	Scrapers	1	5.60	367	0.48	10	0.05	493
	Signal Boards	2	5.60	6	0.82	10	0.05	28
	Skid Steer Loaders	1	5.60	65	0.37	10	0.05	67
	Sweepers/Scrubbers	1	2.00	64	0.46	10	0.05	29
	Rubber Tired Loaders	1	5.60	203	0.36	10	0.05	205
Grading	Crawler Tractors	1	5.60	212	0.43	20	0.05	510
	Excavators	2	5.60	158	0.38	20	0.05	672
	Generator Sets	1	5.60	84	0.74	20	0.05	348
	Graders	2	5.60	187	0.41	20	0.05	859
	Off-Highway Tractors	2	5.60	124	0.44	20	0.05	611
	Plate Compactors	2	5.60	8	0.43	20	0.05	39
	Rollers	2	5.60	80	0.38	20	0.05	340
	Rubber Tired Loaders	2	5.60	203	0.36	20	0.05	29,466
	Scrapers	2	5.60	367	0.48	20	0.05	1,973
	Signal Boards	2	5.60	6	0.82	20	0.05	55
	Skid Steer Loaders	1	5.60	65	0.37	20	0.05	135
	Sweepers/Scrubbers	1	2.00	64	0.46	20	0.05	59
Building Construction	Aerial Lifts	4	3.20	63	0.31	230	0.05	2,875
	Air Compressors	1	3.20	78	0.48	230	0.05	1,378
	Cranes	2	3.20	231	0.29	230	0.05	4,930
	Generator Sets	1	3.20	84	0.74	230	0.05	2,287
	Rough Terrain Forklifts	2	3.20	100	0.40	230	0.05	2,944
	Sweepers/Scrubbers	1	3.20	64	0.46	230	0.05	1,083
Paving	Pavers	1	5.60	130	0.42	20	0.05	306
	Paving Equipment	1	5.60	132	0.36	20	0.05	266
	Plate Compactors	1	5.60	8	0.43	20	0.05	19
	Rollers	2	5.60	80	0.38	20	0.05	340
	Signal Boards	2	5.60	6	0.82	20	0.05	55
	Skid Steer Loaders	1	5.60	65	0.37	20	0.05	135
	Sweepers/Scrubbers	1	5.60	64	0.46	20	0.05	165
	Cement and Mortar Mixers	2	6.00	9	0.56	20	0.05	60

Phase	Equipment Type	Units	Hours	Horse Power	Load Factor	Number of Days	Fuel Usage/ HP/hr	Diesel Usage (in gallons)
	Tractors/Loaders/Backhoes	1	8.00	97	0.37	20	0.05	287
Architectural Coating	Aerial Lifts	1	1.20	63	0.31	20	0.05	23
Daycare Center								
Site Preparation	Crawler Tractors	1	5.60	212	0.43	5	0.05	128
	Excavators	1	5.60	158	0.38	5	0.05	84
	Generator Sets	1	5.60	84	0.74	5	0.05	87
	Off-Highway Tractors	1	5.60	124	0.44	5	0.05	76
	Rubber Tired Loaders	1	5.60	203	0.36	5	0.05	102
	Scrapers	1	5.60	367	0.48	5	0.05	247
	Signal Boards	2	8.00	6	0.82	5	0.05	20
	Skid Steer Loaders	1	5.60	65	0.37	5	0.05	34
	Sweepers/Scrubbers	1	2.00	64	0.46	5	0.05	15
Grading	Crawler Tractors	1	5.60	212	0.43	10	0.05	255
	Excavators	2	5.60	158	0.38	10	0.05	336
	Generator Sets	1	5.60	84	0.74	10	0.05	174
	Graders	2	5.60	187	0.41	10	0.05	429
	Off-Highway Tractors	2	5.60	124	0.44	10	0.05	306
	Plate Compactors	2	5.60	8	0.43	10	0.05	19
	Rollers	2	5.60	80	0.38	10	0.05	170
	Rubber Tired Loaders	2	5.60	203	0.36	10	0.05	409
	Scrapers	2	5.60	367	0.48	10	0.05	986
	Signal Boards	2	8.00	6	0.82	10	0.05	39
	Skid Steer Loaders	1	5.60	65	0.37	10	0.05	67
	Sweepers/Scrubbers	1	2.00	64	0.46	10	0.05	29
Building Construction	Air Compressors	1	3.20	78	0.48	85	0.05	509
	Cranes	2	3.20	231	0.29	85	0.05	1,822
	Generator Sets	1	3.20	84	0.74	85	0.05	845
	Rough Terrain Forklifts	2	3.20	100	0.40	85	0.05	1.088
	Sweepers/Scrubbers	1	3.20	64	0.46	85	0.05	400
Paving	Pavers	1	5.60	130	0.42	5	0.05	76
	Paving Equipment	1	5.60	132	0.36	5	0.05	67
	Plate Compactors	2	5.60	8	0.43	5	0.05	10
	Rollers	2	5.60	80	0.38	5	0.05	85
	Signal Boards	2	8.00	6	0.82	5	0.05	20
	Skid Steer Loaders	1	5.60	65	0.37	5	0.05	34
	Sweepers/Scrubbers	1	2.00	64	0.46	5	0.05	15
Architectural Coating	Aerial Lifts	1	1.20	63	0.31	65	0.05	76
							Hagar Site Total	**61,764**

Phase	Equipment Type	Units	Hours	Horse Power	Load Factor	Number of Days	Fuel Usage/ HP/hr	Diesel Usage (in gallons)
Source: Construction Schedule in Appendix 4.2; Illingwoth and Rodkin, 2018.								

Table 4.14-3
Construction Period Petroleum Fuel Consumption – Heller Site

Phase	Number of Daily Trips	Number of Days	Average Round-Trip Commute Distance (in miles)	Fuel Usage (mpg)[a]	Gasoline/Diesel Usage (in gallons)
Worker Trips (Gasoline)					
Demolition	18	80	10.8	18.6	836
Site Preparation	38	20	10.8	18.6	406
Grading	118	45	10.8	18.6	3,083
Building Construction	698	445	10.8	18.6	180,354
Coatings	25	35	10.8	18.6	508
Architectural Coating	31	35	10.8	18.6	630
				Total Gasoline Usage	**185,817**
Vendor Trips (Diesel)					
Building Construction	121	445	7.30	25.1	1,584
Hauling Trips (Diesel)					
Demolition	1,086[b]	--	20	25.1	865
Grading	5,000[b]	--	20	25.1	3,984
				Total Diesel Usage	**6,433**

Source: CalEEMod Model Data; Illingworth & Rodkin 2018
Notes:
mpg – miles per gallon
a. This is a conservatively estimated total, as it assumes no electric, hybrid or other alternate fuel use vehicles in the fleet mix.
b. Total number of haul trips for entire phase

Table 4.14-4
Construction Period Petroleum Fuel Consumption – Hagar Site

Phase	Number of Daily Trips	Number of Days	Average Round-Trip Commute Distance (in miles)	Fuel Usage (mpg)[a]	Gasoline/Diesel Usage (in gallons)
Residential					
Worker Trips (Gasoline)					
Site Preparation	25	10	10.80	18.6	145

Phase	Number of Daily Trips	Number of Days	Average Round-Trip Commute Distance (in miles)	Fuel Usage (mpg)[a]	Gasoline/Diesel Usage (in gallons)
Grading	50	20	10.80	18.6	580
Building Construction	112	230	10.80	18.6	14,957
Paving	23	20	10.80	18.6	267
Architectural Coating	22	20	10.80	18.6	255
				Total Gasoline Usage	**16,204**
Vendor Trips (Diesel)					
Building Construction	18	230	7.3	25.1	1,204
Hauling Trips (Diesel)					
Grading	250[b]	--	20	25.1	199
				Total Diesel Usage	**1,403**
Daycare					
Worker Trips (Gasoline)					
Site Preparation	25	5	10.80	18.6	73
Grading	50	10	10.80	18.6	290
Building Construction	6	85	10.80	18.6	296
Paving	25	5	10.80	18.6	73
Architectural Coating	3	65	10.80	18.6	113
				Total Gasoline Usage	**845**
Vendor Trips (Diesel)					
Building Construction	2	85	7.3	25.1	49
Hauling Trips (Diesel)					
Grading	250	10	20	25.1	1,992
				Total Diesel Usage	**2,041**

Source: CalEEMod Model Data; Illingworth & Rodkin 2018
Notes:
mpg – miles per gallon
a. This is a conservatively estimated total, as it assumes no electric, hybrid or other alternate fuel use vehicles in the fleet mix.
b. Total number of haul trips for entire phase

APPENDIX 7.1

Water Supply Evaluation

FINAL

Water Supply Evaluation for University of California Santa Cruz 2005 Long Range Development Plan

Prepared for

Impact Sciences

March 2018

WEST YOST ASSOCIATES
Consulting Engineers

694-12-17-02

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consulting engineers

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FINAL | MARCH 2018

Water Supply Evaluation for University of California Santa Cruz 2005 Long Range Development Plan

Prepared for

Impact Sciences

Project No. 694-12-17-02

Project Manager: Elizabeth Drayer, P.E.	03-21-18 Date
QA/QC Review: Gerry Nakano, P.E.	03-21-18 Date

WEST YOST ASSOCIATES

Carlsbad

2173 Salk Avenue, Suite 250
Carlsbad, CA 92008
(760) 795-0365

Davis

2020 Research Park Drive, Suite 100
Davis, CA 95618
(530) 756-5905

Eugene

1650 W 11th Ave. Suite 1-A
Eugene, OR 97402
(541) 431-1280

Irvine

6 Venture, Suite 290
Irvine, CA 92618
(949) 517-9060

Pleasanton

6800 Koll Center Parkway, Suite 150
Pleasanton, CA 94566
(925) 426-2580

Portland

4949 Meadows Road, Suite 125
Lake Oswego, OR 97035
(503) 451-4500

Sacramento

2725 Riverside Boulevard, Suite 5
Sacramento, CA 95818
(916) 504-4915

Santa Rosa

2235 Mercury Way, Suite 105
Santa Rosa, CA 95407
(707) 543-8506

Sunnyvale

1250 Oakmead Parkway, Suite 210
Sunnyvale, CA 94085
(408) 451-8453

Walnut Creek

1777 Botelho Drive, Suite 240
Walnut Creek, CA 94596
(925) 949-5800

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EXECUTIVE SUMMARY

Purpose of Water Supply Evaluation

The purpose of this Water Supply Evaluation is to perform an evaluation of the availability and reliability of water supplies to serve development completed to date and remaining planned development under the University of California Santa Cruz (UCSC) 2005 Long Range Development Plan (LRDP) based on existing UCSC water demands and projected water demands for remaining projects to be developed under the 2005 LRDP. Some development has already occurred on the UCSC Main Campus under the 2005 LRDP; however, development to date has been significantly less than originally envisioned when the 2005 LRDP was prepared. Development completed to date and remaining planned development under the 2005 LRDP, including the proposed Student Housing West project, is the subject of this Water Supply Evaluation.

Projected Water Demands

Water demands on the UCSC Main Campus and at the Coastal Science Campus have dropped dramatically in recent years as a result of water conservation measures in response to the recent drought conditions. Many of the implemented water conservation measures have resulted in permanent reductions in water use (e.g., plumbing fixture retrofits, improvements in leak detection, etc.). During the recent drought years, UCSC has successfully met the City of Santa Cruz (City) mandatory water reduction goals as a result of close collaboration between representatives of all sectors across the campus, as well as with the City Water Department.

The previously projected water demands for UCSC (all facilities), included in the City's 2015 Urban Water Management Plan (UWMP), were based on the University's previously estimated full development demand of 349 million gallons per year (MGY)[1]. The 349 MGY was based on the projected water demand estimated in the 2005 LRDP EIR and 2008 Settlement Agreement, and included existing and projected Main Campus water demand and existing and projected water demand for the University's Coastal Science Campus and the 2300 Delaware Property.

The projected water demands for UCSC are now projected to be approximately 220 MGY by 2023. This includes existing water demands for the Main Campus, the 2300 Delaware Property, and the Coastal Science Campus; projected additional water demands for the Coastal Science Campus; and projected additional water demands for the remaining planned development on the Main Campus and the 2300 Delaware Property under the 2005 LRDP. Although the 2005 LRDP has a

[1] This water demand estimate was based on the UCSC projected water demand developed for the City's SOI Amendment EIR (339 MGY) plus 10 MGY of additional water demands for additional development beyond 2020 (Source: City of Santa Cruz SOI Amendment EIR Table 2-4 and City of Santa Cruz 2010 UWMP (page 4-19)). This water demand estimate was the basis for the UCSC demand estimate included in the City's 2015 UWMP.

horizon year of 2020-2021, the construction of the remaining development under the 2005 LRDP is anticipated to be completed by approximately 2023.[2]

Water Supply Availability and Reliability

The currently projected water demand of approximately 220 MGY in 2023 for the 2005 LRDP is considerably lower than the full development demand of 349 MGY previously estimated, and is consistent with the water demand projected for UCSC in the City's 2015 UWMP for the 2020 to 2025 time period (which ranged from 196 MGY in 2020 to 234 MGY in 2025). Therefore, the water supply and reliability analysis, and timing of these new water system demands, as included in the City's 2015 UWMP, is still applicable.

As described in Section 7 of this Water Supply Evaluation, the City does project water supply shortages during dry years in its 2015 UWMP. As a City water customer, UCSC is subject to these potential water shortages and is subject to the City's water supply allocation system and demand reduction measures. As described, UCSC has been very successful in reducing water use in recent years in response to the drought, and is actively developing an updated Water Action Plan to implement additional measures to further reduce potable water use on the campus.

[2] UCSC has commenced the preparation of an updated LRDP for the Main Campus and the 2300 Delaware Property, which will plan for enrollment growth beyond the enrollment level of 19,500 students, and will provide for the development of facilities to serve that enrollment growth.

1.0 INTRODUCTION

1.1 Background

The University of California Santa Cruz (UCSC) 2005 Long Range Development Plan (LRDP), which was approved by the University of California Regents in September 2006, provides a comprehensive framework for the physical development of the UCSC Main Campus to accommodate an on-campus three-quarter average enrollment of 19,500 students, or an increase of approximately 5,100 students from the 2003-04 baseline. The 2005 LRDP covers the Main Campus and the facility located at 2300 Delaware Street, but excludes the Coastal Science Campus which has its own Coastal LRDP. The 2005 LRDP identifies targets for on-campus housing for 50 percent of undergraduate students and 25 percent of graduate students. Thus, the 2005 LRDP Environmental Impact Report (EIR)[3] evaluated the addition of 2,300 student beds to the inventory of 6,891 beds existing in Fall 2004, for a total of 9,190 beds.

As part of a 2008 Comprehensive Settlement Agreement that resolved lawsuits by the City and County of Santa Cruz and nine citizens, the University agreed that UCSC will provide housing to accommodate 67 percent of new student enrollment within four years of reaching that enrollment. At a total enrollment of 19,500 students, UCSC would need to provide university housing for 10,125 students, which would be 935 more student beds than analyzed in the 2005 LRDP EIR. In addition, as part of the Settlement Agreement, the University agreed that housing development in the area west of Porter College will be initiated before development of new bed spaces in the North Campus Area.

To address the conditions set forth in the Settlement Agreement, and to address existing and projected demand for housing on the campus and the UC system-wide Housing Initiative, which was announced by UC President Janet Napolitano in January 2016, UCSC has put forth a student housing project that would be located in the western portion of the campus. The Student Housing West project would construct up to 3,000 new beds of student housing for upper division undergraduate students, graduate students and students with families, including support spaces, amenities and associated infrastructure on two sites: the Heller site located between Empire Grade Road and Heller Drive, and the Hagar site located at the northeast corner of the intersection of Glenn Coolidge Drive and Hagar Drive. The project is envisioned to be constructed in phases, with the first phase available for occupancy by Fall 2020, and the remainder of the project completed by Fall 2022. UCSC also envisions that, as two separate projects, 22 student beds will be added to Crown College by 2021 and 185 student beds will be added to Kresge College by 2022-2023. These new beds would enable UCSC to eliminate some overflow beds in existing housing, and meet its commitments under the 2008 Settlement Agreement.

[3] University of California Santa Cruz Long-Range Development Plan 2005 - 2020, Final Environmental Impact Report (FEIR), October 2005.

1.2 Legal Requirement for Completion of a Water Supply Assessment

California Senate Bill 610 (SB 610) amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 sought to promote more collaborative planning between local water suppliers and cities and counties. The statute requires detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects. The purpose of this coordination is to ensure that prudent water supply planning has been conducted, and that planned water supplies are adequate to meet existing demands, anticipated demands from approved projects and tentative maps, and the demands of proposed projects.

SB 610 amended California Water Code sections 10910 through 10915 (inclusive) to require land use lead agencies to:

- Identify any public water purveyor that may supply water for a proposed development project; and
- Request a Water Supply Assessment (WSA) from the identified water purveyor.

The purpose of a WSA is to demonstrate the sufficiency of the purveyor's water supplies to satisfy the water demands of the proposed development, while still meeting the water purveyor's existing and planned future uses. Water Code sections 10910 through 10915 delineate the specific information that must be included in the WSA.

Although the SB 610 requirements do not specifically apply to UCSC or the University, because it is not a city or county, the University has voluntarily elected to prepare a WSA-like document to determine and demonstrate the sufficiency of the City's water supplies to satisfy the water demand of the planned development under the 2005 LRDP, including the proposed Student Housing West project.

A WSA was prepared for the City of Santa Cruz Sphere of Influence (SOI) Amendment EIR in 2009[4], which evaluated the projected water demands and available water supplies for the UCSC 2005 LRDP and Settlement Agreement (further discussion of this previous WSA is provided in Section 3 of this Water Supply Evaluation).

Also, projected water demands for UCSC were included in the City of Santa Cruz 2010 and 2015 Urban Water Management Plans (UWMPs) (discussed further in Section 3.3 of this Water Supply Evaluation).

1.3 Purpose, Format and Organization of Water Supply Evaluation

Per the terms of the 2008 Settlement Agreement, UCSC agreed to not "tier" from or otherwise rely on the 2005 LRDP EIR water or housing analyses as invalidated by the Santa Cruz Superior Court

[4] City of Santa Cruz, Sphere of Influence Amendment, Water Supply Assessment, prepared by Erler & Kalinowski, Inc., September 2009.

for evaluation of future projects under the 2005 LRDP. Therefore, the purpose of this Water Supply Evaluation is to perform an evaluation of the availability and reliability of water supplies to serve development completed to date and remaining planned development under the UCSC 2005 LRDP, including the proposed Student Housing West project, based on existing UCSC water demands, water use patterns, and projected water demands for remaining projects to be developed under the 2005 LRDP. Some development has already occurred on the UCSC Main Campus under the 2005 LRDP; however, development to date has been significantly less than originally planned. Remaining planned development under the 2005 LRDP, including the proposed Student Housing West project, is described in this Water Supply Evaluation along with existing and projected water demands for the UCSC Main Campus.

Evaluation criteria and assumptions used for this Water Supply Evaluation are consistent with those used by the City in their 2015 UWMP. Furthermore, this Water Supply Evaluation has been prepared and organized to parallel and be consistent with the requirements for a WSA per Water Code sections 10910 through 10915, such that this evaluation provides a comprehensive and up-to-date evaluation of the availability and reliability of water supplies to serve the planned development.

This Water Supply Evaluation includes the following sections:

- Section 1: Introduction
- Section 2: Description of Proposed Project
- Section 3: Required SB 610 Determinations
- Section 4: City of Santa Cruz Water Service Area
- Section 5: City of Santa Cruz Water Demands
- Section 6: City of Santa Cruz Water Supplies
- Section 7: Determination of Water Supply Sufficiency Based on the Requirements of SB 610
- Section 8: Evaluation Findings
- Section 9: References

Relevant citations of Water Code sections 10910 through 10915 are included throughout this Water Supply Evaluation in italics to demonstrate compliance with the specific requirements of SB 610.

The purpose of this Water Supply Evaluation is not to reserve water, or to function as a "will serve" letter or any other form of commitment to supply water (see Water Code section 10914). The provision of water service will continue to be undertaken in a manner consistent with applicable City of Santa Cruz (City) policies and procedures, consistent with existing law.

This Water Supply Evaluation will be included as an appendix to the Draft EIR for the proposed Student Housing West project and the conclusions reached in this document will be considered in analyzing the project's potential impacts on water supply.

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2.0 DESCRIPTION OF PROPOSED PROJECT

2.1 UC Santa Cruz Development Plans

2.1.1 2005 Long-Range Development Plan

On September 21, 2006, the University of California Regents adopted the Final 2005 LRDP for the UCSC Main Campus after certification of the 2005 LRDP Final EIR. The Final 2005 LRDP identifies UCSC's campus goals and development objectives and provides a map of the proposed campus land uses through the year 2020. The Final 2005 LRDP is a planning framework for the development that is anticipated to accommodate the academic, research, student and faculty services through the academic year 2020-2021. As part of the Final 2005 LRDP, UCSC enrollment is expected to reach approximately 19,500 students by the year 2020.

2.1.2 2008 Comprehensive Settlement Agreement

The 2005 LRDP Final EIR was legally challenged in 2007 by several entities, including the City of Santa Cruz. A ruling by the Santa Cruz County Superior Court in City of Santa Cruz et. al. v. Regents of the University of California et. al. (CV155571, consolidated with Case No. CV155583) concluded that additional analyses relating to the water supply, housing, and traffic mitigation were required. In August 2008, a Comprehensive Settlement Agreement (Settlement Agreement) was executed by all parties to resolve the lawsuits. The Settlement Agreement was entered as a final judgment of the Court, thereby superseding the previous court ruling.

Key provisions of the Settlement Agreement are as follows[5]:

- ***Enrollment:*** The 2005 LRDP projected a full-time equivalent (FTE) on campus three-quarter average (fall-winter-spring) combined graduate and undergraduate enrollment of 19,500 in academic year 2020-2021. The Settlement Agreement revised the 2005 LRDP enrollment projections by limiting undergraduate enrollment to 17,500, and total on-campus combined graduate and undergraduate to 19,480 in academic year 2020-2021. The Settlement Agreement provides that enrollment will be adjusted downward by UCSC if its settlement housing commitment (see below) is not met or water demand increases during a City service area-wide moratorium.
- ***Housing:*** UCSC will provide 7,125 beds for student enrollment up to 15,000 and will provide additional housing to accommodate 67 percent of new-student enrollment above 15,000. This results in provision of a total of 10,125 available beds for an enrollment of 19,500. The 2005 LRDP originally called for UCSC to provide housing for 50 percent of undergraduates and 25 percent of graduate students during the life of LRDP for a total of 9,190 beds. The Settlement Agreement increases student housing by 935 beds that will be provided by new construction, remodeling, and off-campus housing, the latter of which is limited to no more than 225 beds. UCSC will also

[5] Source: City of Santa Cruz, Planning and Community Development Department, Comprehensive Settlement Agreement Summary.

contribute specified fees to the City for each UCSC-owned or leased, off-campus student bed that results in a tax revenue loss to the City (which will be used by the City to support services for UCSC's off-campus population). UCSC's increased housing commitment will revert to the 2005 LRDP commitment under conditions specified in the Settlement Agreement.

- ***Water and Sewer Services:*** To support UCSC in achieving its on-campus housing commitment, the City agreed to continue to provide water service to the campus through the existing connections. The Settlement Agreement requires the City and UCSC to concurrently apply to the Santa Cruz LAFCO for a Sphere of Influence amendment (City application) and for extraterritorial water and sewer services (University application) for the area identified as the North Campus to allow for the development of 3,175,000 gross square feet of additional building space as described in the 2005 LRDP.[6] The Agreement provides that UCSC's housing commitment under the Agreement will be excused if the LAFCO decision is legally challenged, and the final judicial determination upholds a LAFCO denial or reverses a LAFCO approval of the University's application.

  UCSC will pay a fee for increased water use (equivalent to the City's "system development charges") to cover its proportional share of use of City-developed new water source capacity and the City's construction of public facilities to serve UCSC's non-drought water demand on the Main Campus. Additionally, UCSC will comply with any service area-wide water restrictions and mandatory use curtailment imposed by the City in response to a declaration of water shortage emergency and/or if the City establishes a service area-wide moratorium on new connections because of a water shortage emergency.

- ***2005 LRDP & LRDP EIR:*** For future projects under the 2005 LRDP, UCSC will not "tier" from or otherwise rely on the 2005 LRDP EIR water or housing analyses as invalidated by the Santa Cruz Superior Court.

2.1.3 Planned Development under the 2005 LRDP

The 2005 LRDP originally estimated that a total of approximately 3,175,000 gross square feet (gsf) of additional academic buildings, support facilities, and student housing would be required to support a total future enrollment level of 19,500 students. To date, only a small amount of additional building space (176,197 gsf) has been added under the 2005 LRDP, and the University has determined that only a small amount of additional building space and a substantial amount of new housing will be added to the Main Campus under the 2005 LRDP. Development completed to date and remaining planned development under the 2005 LRDP, including the proposed Student Housing West project, is the subject of this Water Supply Evaluation.

[6] Final Environmental Impact Report for City of Santa Cruz Sphere of Influence Amendment (to include part of the UCSC North Campus) and Provision of Extraterritorial Water & Sewer Service (to part of UCSC North Campus) was certified by the Santa Cruz City Council on August 3, 2010.

The anticipated remaining projects to be added under the 2005 LRDP, along with their current development status and anticipated year of completion, are summarized in Table 2-1.

Table 2-1. Remaining Projects to be Developed under the UCSC 2005 LRDP

Project	Use	New Square Footage/Development	Current Development Status	Anticipated Year of Completion
Student Life Seismic 2B	Student Services	up to 2,220 gsf	Design	2019
Environmental Health & Safety (EH&S)	Regulated Waste Storage/Handling	7,100 gsf	Construction	2018
Kresge College	Student Housing, Student Services, and Academic	60,000 gsf (net new); 185 undergraduate student beds (residence hall)	Design	2023
Crown College	Student Housing	22 net new undergraduate student beds (residence hall)	Construction	2021
Rachel Carson and Porter Dining Hall Expansion	Dining Services	To be determined, but not more than 10,000 new gsf	Pre-design	2022
Ranch View Terrace Phase 2	Employee Housing	42 - 3 to 4 bedroom single-family homes	Approved, on hold	2023
Student Health Services Addition	Student Services	14,000 gsf	Planned	2023
Student Housing West	Student Housing	Heller Site: 2,652 undergraduate student beds and 200 graduate student beds Hagar Site: 148 beds for students with families; childcare center; demolition of existing Family Student Housing (FSH) complex	Design	2022

Source: Impact Sciences, June 2017: Cumulative Projects for EIR 6-7-17.xlsx and Impact Sciences, December 2017: Project Description for Student Housing West EIR

2.2 Projected Water Demand

Projected water demand for the remaining projects to be developed under the 2005 LRDP, as well as the existing water demand for the Main Campus, and existing and projected water demand for the 2300 Delaware property, have been estimated for this Water Supply Evaluation. Water demand for the Coastal Science Campus is also included in this evaluation.

Projected water demands for the remaining projects to be developed have been estimated based on existing water use for similar existing facilities on the UCSC Main Campus. Historical water use patterns for existing undergraduate, graduate and employee housing facilities were reviewed to evaluate pre-drought and drought water use trends and estimate a demand rebound factor to account for post-drought water use, assuming that not all of the water conservation which has been achieved is permanent. Overall, it was estimated that post-drought water use would rebound to a level about halfway between the reduced drought water use (which averaged about 160 MGY for the Main Campus) and the higher pre-drought water use (200 MGY in 2008 for the Main Campus). This resulted in an estimated demand rebound factor of approximately 12 percent above actual 2016 water uses.

Estimated water demand for the remaining projects to be developed under the 2005 LRDP are summarized in Table 2-2. Overall, the projected potable water demand for the remaining projects under the 2005 LRDP is estimated to be approximately 30.8 MGY.[7]

[7] Recycled water use is also proposed as part of the Student Housing West project for toilet flushing and irrigation uses at the Heller site, and is estimated to be approximately 13.7 MGY (see Table 2-2).

Table 2-2. Summary of Water Demand Projections for Remaining Projects included in the UCSC 2005 LRDP

Water Demand Category	Project Description	[A] New Development Square Footage or Beds[a]	[B] Water Use Factor[b,c], gpd	[C] Water Demand, gpd [C] = [A] x [B]	[D] Annual Water Demand, gallons
Office/Classroom	Student Life Seismic 2B	2,220 GSF	0.018	40	14,585
	Kresge College (Student Services and Academic)	60,000 GSF	0.018	1,080	394,200
	Student Health Services Addition	14,000 GSF	0.018	252	91,980
Housing/Apt	Rachel Carson and Porter Dining Hall Expansion	10,000 GSF	--		
		3,222 new students	5	14,499	5,292,135
	Kresge College (Student Housing--undergrad--residence hall)	185 bed (undergrad)	17	3,145	1,147,925
	Crown College (Student Housing--undergrad--residence hall)	22 bed (undergrad)	17	374	136,510
	Ranch View Terrace Phase 2 (42 3-4 BR single family homes)	42 SF homes	138	5,796	2,115,540
	Student Housing West (Heller Site: 2,652 undergrad apartment beds, 200 graduate apartment beds with 300 occupants) (Hagar Site: 148 family apartments, Childcare Center--less 196 FSH apartment student beds to be removed)	2,652 bed (undergrad apartments)	see note (b) below	61,255	16,704,313
		200 bed (graduate apartments)		6,579	2,350,195
		148 family apartments		15,419	5,508,611
		1 childcare center		1,442	515,185
		(196) family apartments		(19,720)	(7,197,915)
Irrigation (Potable Water)	Student Housing West (Hagar Site)		see note (b) below	9,579	3,496,267
Mechanical/Cooling	EH&S Regulated Waste Storage/Handling	7,100 GSF	see note (d) below	517	188,705
			Potable Water Demand Totals	**100,256**	**30,758,236**
Toilet Flushing and Irrigation (Recycled Water)	Student Housing West (Heller Site)		see note (b) below	46,627	13,688,861
			Recycled Water Demand Totals	**46,627**	**13,688,861**

Abbreviations:
gpd = gallons per day
GSF = gross square feet
LRDP = Long Range Development Plan
mgy = millions gallons per year

Notes:
(a) From "Cumulative Projects for EIR 6-7-17.xlsx" received from Impact Sciences.
(b) Water Use Factors based on the following:

Office/Classroom based on Low Flow Water Use Factors developed for the 2005 LRDP (ARUP, 2006; Table 4). Water use factor is somewhat dated, but provides for a conservative estimate as water efficiency standards are now more stringent.
Dining Hall water use based on 2016 water use for the dining halls (12 mgy for 8,898 students living on campus = 4 gpd per student)(data provided by Alisa Klaus, UCSC, July 2017) plus 12% rebound for increased water use following the drought.
Kresge and Crown undergraduate student housing based on 2016 water use for student housing residence halls (14.5 gpd per bed) plus 12% rebound to account for increased water use following the drought.

Student Housing West (Heller Site and Hagar Site) water use based on water use estimates prepared by Puttman Infrastructure dated 01/17/18 (see Appendix A). Heller Site water use estimates assume recycled water use for toilet flushing and irrigation. Hagar Site water use estimates assume no recycled water use.
Employee Housing (Ranch View Terrace) based on 2016 water use for Ranch View Terrace Phase 1 housing (123 gpd per housing unit, includes irrigation) plus 12% for increased water use following the drought.

(c) Demand rebound based on average of 2008 Main Campus water use (pre-drought) (201 mgy) and annual average water consumption for the Main Campus for 2009 through 2016 (drought years) (160 mgy); rebound assumes that water use will increase somewhat following the end of the drought, but only halfway between pre-drought and 2016 levels; equates to a demand rebound factor of 12% above 2016 water use.
(d) Estimated water demand for EH&S Facility per Draft Initial Study/Mitigated Negative Declaration for UCSC Environmental Health and Safety Facility, dated April 2016.

References:

1. ARUP, 2006. Memorandum entitled UC Santa Cruz: LRDP EIR Water Demand Projections for 19,500 Enrollment Alternative - Calculation Summary, prepared for Alisa Klaus, UCSC, dated August 28, 2006.
2. Impact Sciences, 2017. Table listing Cumulative Projects for EIR, received May 9, 2017.
3. City of Santa Cruz, 2017. Information Report: Water Use Efficiency at the University of California, dated May 2, 2017.
4. 2016 Water Consumption Data: "Student APTS meters 2016 by month.xlsx" and "Student Housing Res Halls 2016.xlsx"; Historical Water Consumption data for Ranch View Terrace "Employee Housing 2016 monthly.xlsx" and "RVT irrigation 2016.xlsx".
5. UCSC, 2018. Water Use Calculations for UCSC Student Housing West Project, prepared by Interface, Puttman and UCSC (included in Appendix A).

Table 2-3 provides a summary of the UCSC existing and projected potable water demands at full development under the 2005 LRDP (estimated to occur by about 2023). As shown, the total potable water demand for UCSC is projected to be approximately 220 MGY by 2023.

Table 2-3. Existing and Projected Potable Water Demand at Buildout of the UCSC 2005 LRDP

Area	Potable Water Demand, MGY	Comments
Existing Water Demand		
Main Campus	180	Based on 2016 water use (161 MGY) with 12% demand rebound
2300 Delaware Property	0.3	Based on 2016 water use
Coastal Science Campus	4.0	Based on 2016 water use (no demand rebound is assumed as recent conservation projects on the Coastal Science Campus permanently reduced potable water use)
Total Existing Potable Water Demand	184.3	
Projected Water Demand		
Remaining Projects to be developed under the 2005 LRDP	30.8	See Table 2-2 above
2300 Delaware Property	2.7	Projected additional water demand for 2300 Delaware per 2015 projection (includes cooling water and Building C labs and restrooms and removal of lawn per EIR mitigation)
Coastal Science Campus	1.9	Based on estimated water use for Coastal Biology Building (CBB) Project per Table 3.16-5 of the UC Santa Cruz Marine Science Campus (MSC) Projects Final EIR (dated November 2011)
Total Projected Potable Water Demand	35.4	
Total Potable Water Demand at Buildout of the UCSC 2005 LRDP	**219.7**	Buildout estimated to occur by 2023

As described in Section 3.3 of this Water Supply Evaluation, the projected water demand for the remaining projects to be developed under the 2005 LRDP is included in the City's 2015 Urban Water Management Plan (2015 UWMP), and is considerably less than the buildout water demand previously projected, due to less proposed development, lower unit water use due to permanent water conservation measures, and reduced existing water use on the UCSC Main Campus.

2.3 Projected Water Supply

2.3.1 Potable Water Supply

Most of the UCSC Main Campus and all of the 2300 Delaware property are located within the City of Santa Cruz Water Department water service area. Under the terms of a 1962 Water Services Agreement between the City of Santa Cruz and the University, the City agreed to provide sufficient water to meet University growth. The 1962 agreement also states that the City will provide, at no expense to the University, water and sewer lines up to the boundaries of the campus. An additional agreement made between the University and City of Santa Cruz in 1965 states that the City will install a water system capable of supplying 2 million gallons per day to the campus. Through these agreements, the University has contracted for adequate water service for the entire campus, including the unincorporated areas. The University executed a Memorandum of Understanding with the City of Santa Cruz under which the University agreed to pay the cost of certain pump upgrades that could be needed in the future to serve the campus.[8]

As discussed in Section 2.1 above, under the 2008 Settlement Agreement, the City agreed to continue to provide water service to the campus through the existing connections, and UCSC agreed to pay a fee for increased water use (equivalent to the City's "system development charges") to cover its proportional share of use of City-developed new water source capacity and the City's construction of public facilities to serve UCSC's non-drought water demand on the Main Campus. Additionally, under the 2008 Settlement Agreement, UCSC has and will continue to comply with any service area-wide water restrictions and mandatory use curtailment imposed by the City in response to a declaration of water shortage emergency and/or if the City establishes a service area-wide moratorium on new connections because of a water shortage emergency. The City has agreed to treat UCSC as it would any other developer with regard to its remaining excess water supply capacity.

A description of the City's water supplies is provided in Section 6 of this Water Supply Evaluation. A description of the UCSC water conservation program success is provided in Section 7 of this Water Supply Evaluation.

2.3.2 Recycled Water Supply

Wastewater generated on the Heller site would be collected via an underground sewer line system constructed as part of the proposed project and would be conveyed to a wastewater treatment facility that would be located in the southeastern portion of the Heller site. The facility would be a membrane bioreactor (MBR) plant to treat the wastewater and generate recycled water for use on the Heller site and, potentially, in existing student residence halls at Porter College.

[8] Source: University of California Santa Cruz Long-Range Development Plan 2005 - 2020, Final Environmental Impact Report (FEIR), Volume II, October 2005.

Recycled water (treated effluent) generated at the MBR plant would be pumped into a recycled water main and distribution system ("purple" pipes) and conveyed throughout the Heller site development to provide water for toilet flushing and landscape irrigation. Recycled water would also be conveyed north via a recycled water main that would be located in the utility corridor extending between the Kresge parking lot and the Heller site. The main would convey recycled water to Porter College where the residence halls are already fitted with dedicated purple pipes for toilet flushing and landscape irrigation. Recycled water may also be available for use at the Hagar site in the future; however, for purposes of this Water Supply Evaluation, only potable water is assumed to be used at the Hagar site.

As shown in Table 2-2, the recycled water demand for remaining projects included in the UCSC 2005 LRDP is estimated to be approximately 13.7 MGY.

3.0 REQUIRED DETERMINATIONS

3.1 Does SB 610 apply to the Proposed Project?

Cities and counties are the only lead agencies specifically required by SB 610 to prepare a water supply assessment for certain projects. Although the SB 610 requirements do not specifically apply to UCSC or the University, because it is not a city or county, the University has voluntarily elected to prepare a WSA-like document to determine and demonstrate the sufficiency of the City's water supplies to satisfy the water demand of the planned development under the 2005 LRDP, including the Student Housing West project.

An EIR was prepared for the UCSC 2005 LRDP and a previous WSA was prepared in conjunction with the City's Sphere of Influence Amendment in accordance with the terms of the Settlement Agreement (see Section 2.1.2). The remaining projects to be developed under the 2005 LRDP are consistent with the 2005 LRDP and the Settlement Agreement.

This Water Supply Evaluation has been prepared to document the projected water demands for the UCSC Main Campus and the 2300 Delaware property and the remaining projects to be developed under the 2005 LRDP and to demonstrate that adequate water supplies are available from the City to meet the projected UCSC water demands. For completeness and clarity, this Water Supply Evaluation has been prepared to comply with SB 610 requirements for a WSA, although SB 610 does not apply to campus development under the 2005 LRDP.

3.2 Who is the Identified Public Water System?

> *10910(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined by Section 10912, that may supply water for the project*
>
> *10912 (c) "Public water system" means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections…*

The UCSC Main Campus and the 2300 Delaware property are located within the City of Santa Cruz Water Department water service area; therefore, the City of Santa Cruz Water Department is the public water system for the proposed project.

3.3 Does the City have an adopted Urban Water Management Plan (UWMP) and does the UWMP include the projected water demand for the Proposed Project?

10910(c)(1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

The City's 2015 UWMP was adopted by the Santa Cruz City Council on August 23, 2016. The City's 2015 UWMP includes existing and projected water demands for all UCSC facilities, including the Main Campus, the 2300 Delaware property, and the Coastal Science Campus. The potable water demand projections included in the City's 2015 UWMP are summarized in Table 3-1.

Table 3-1. Potable Water Demands Included in the City of Santa Cruz 2015 UWMP

	2015, (actual)[a]	2020	2025	2030	2035
Total City Water Demand, MGY[b]	2,452	3,327	3,225	3,205	3,220
UC Santa Cruz, MGY[c]	160	196	234	271	308
UC Santa Cruz Water Demand, as a percent of Total City Water Demand	6.5%	5.9%	7.3%	8.5%	9.6%

(a) 2015 actual demands from City's 2015 UWMP (Table 4-1).
(b) Projected City water demands for 2020 to 2035 are from City's 2015 UWMP (Table 4-3).
(c) Projected UC Santa Cruz water demands for 2020 to 2035 are based on the Primary Projection presented below in Table 3-2.

The water demands for UCSC included in the City's 2015 UWMP are based on the University's previously estimated buildout demand of 349 MGY[9]. The 349 MGY is based on the projected water demand estimated for the 2005 LRDP and 2008 Settlement Agreement and included existing (based on 2007 water use) Main Campus water demand with added existing and projected water demand for the Coastal Science Campus and the 2300 Delaware property. The only change made by City staff to the University water demand projection was to extend UCSC's previous forecast of 349 MGY in 2030 further out into the future to reflect a lower, more realistic, rate of growth with two potential endpoints: 2035 and 2050. In the lower bound forecast, buildout occurs in 2050. In the upper bound forecast, it occurs in 2035. The primary forecast (included in the City's 2015 UWMP) is the midpoint between the lower and upper bound forecasts. These demand forecasts are shown in Table 3-2.

[9] Based on the UCSC projected water demand developed for the City's SOI Amendment EIR (339 MGY) plus 10 MGY of additional water demands for additional development beyond 2020. Source: City of Santa Cruz SOI Amendment EIR Table 2-4 and City of Santa Cruz 2010 UWMP (page 4-19).

Table 3-2. Potable Water Demand Projections for UC Santa Cruz[a]

	2013 (actual)[b]	2020	2025	2030	2035
Low Projection, MGY[c]	182	186	213	240	268
Primary Projection, MGY[d]	**182**	**196**	**234**	**271**	**308**
High Projection, MGY[e]	182	207	254	302	349

(a) Source: City of Santa Cruz 2015 UWMP, Appendix E.
(b) Based on City of Santa Cruz Water Department Billing Records.
(c) Under the Low Projection, buildout is assumed to occur in 2050.
(d) The Primary Projection is the midpoint between the low and high projections.
(e) Under the High Projection, buildout is assumed to occur in 2035.

As described in Section 2.3, the current potable water demand projection for full development under the 2005 LRDP, along with other existing and projected UCSC water demands is approximately 220 MGY, with buildout of the remaining projects under the 2005 LRDP currently anticipated to occur by 2023. The currently projected water demand for the 2005 LRDP is considerably lower than the full development demand of 349 MGY previously estimated, and is consistent with the water demand projected for UCSC in the City's 2015 UWMP for the 2020 to 2025 time period (which ranged from 196 MGY in 2020 to 234 MGY in 2025 under the Primary Projection). As such, the City's 2015 UWMP does include the projected water demand for currently anticipated buildout of the 2005 LRDP by 2023.

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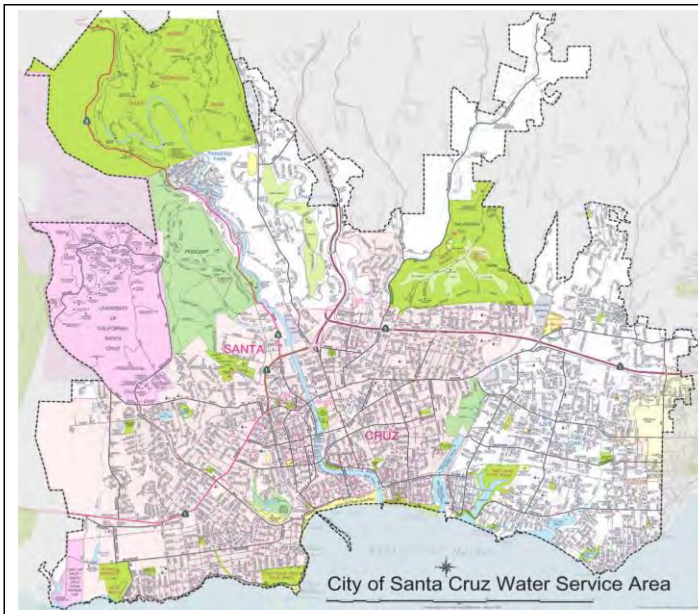
4.0 CITY OF SANTA CRUZ WATER SYSTEM

4.1 Water Service Area

The City of Santa Cruz provides water service to an area approximately 20 square miles in size, including the entire City of Santa Cruz, adjoining unincorporated areas of Santa Cruz County, a small part of the City of Capitola, coastal agricultural lands north of the City, and the UCSC Main Campus, Coastal Science Campus and 2300 Delaware property (located in the western part of the City). A generalized map of the water service area, excluding the north coast, is provided in Figure 4-1. No significant changes to the City's service area boundary have occurred in many years.

According to the City's 2015 UWMP, the current population residing in the Santa Cruz water service area is estimated to be 95,251 people. Approximately two thirds of the total population, almost 64,000, lives inside the City limits. The UCSC Main Campus is located on the west side of the City. About 9,100 people including students, faculty, staff, and their families reside on the UCSC Main Campus.

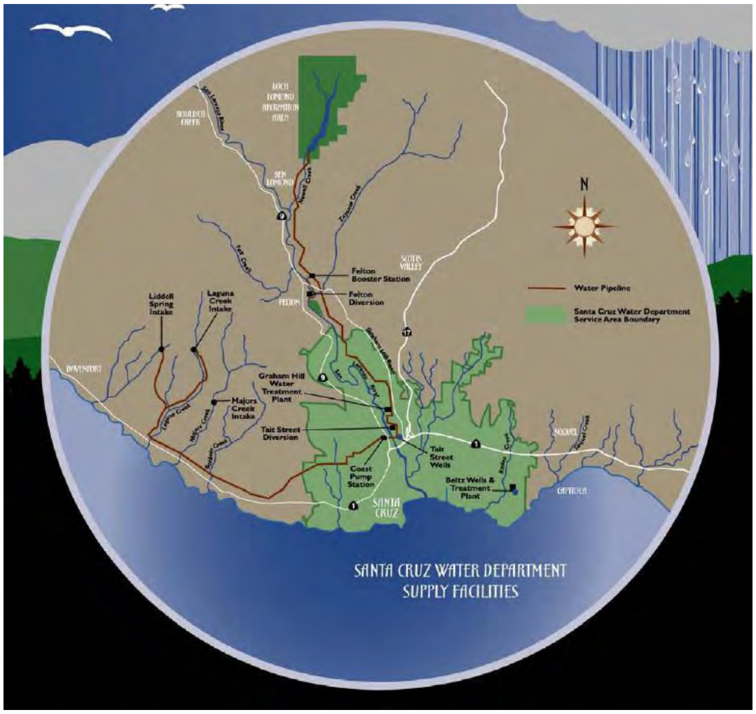


Source: City of Santa Cruz 2015 Urban Water Management Plan, August 2016

Figure 4-1. City of Santa Cruz Water Service Area

4.2 Overview of Water Supply Sources

The Santa Cruz water system relies predominantly on local surface water supplies, which include the following: diversions from three North Coast streams (Reggiardo Creek, Laguna Creek, and Majors Creek) and one natural spring (Liddell Spring); the San Lorenzo River; and Loch Lomond Reservoir. Together, these surface water sources represent approximately 95 percent of the City's total annual water production. The balance of the City's supply comes from groundwater, all of which is extracted from wells in the Purisima Formation in the mid-County area (Live Oak Well system). These main production elements of the City's water supply system are illustrated in Figure 4-2.



Source: City of Santa Cruz 2015 Urban Water Management Plan, August 2016

Figure 4-2. City of Santa Cruz Water Supply System

All of the City's water resources are obtained from local sources. The system relies entirely on rainfall, surface runoff, and groundwater infiltration occurring within watersheds located in Santa Cruz County. No water is purchased from state or federal sources or imported to the region from outside the Santa Cruz area. In general, the City's water system is managed to use available flowing sources to meet daily demands as much as possible. Groundwater and stored water from Loch Lomond are used mainly in the summer and fall months when flows in the coast streams and river sources decline, and additional supply is needed to meet higher daily water demands. On a typical summer day, the North coast sources yield 1 to 2 mgd, the San Lorenzo River produces 7.5 mgd, groundwater makes up 0.8 mgd, and the reservoir contributes an average of 1 to 2 mgd.

4.3 Water Service to UC Santa Cruz

The City of Santa Cruz Water Department (SCWD) supplies water to UCSC for domestic use, fire flow and irrigation on campus. As shown in Table 3-1, UCSC currently accounts for approximately 6.5 percent of the City's total annual water consumption.

The UCSC Main Campus receives potable water through four connections to the SCWD system. SCWD pumps potable water to three consecutive in-line reservoirs at separate elevations ranging from 400 feet to 1,113 feet at a point in the northern campus. The Main Campus water system then distributes water to campus facilities in eight separate pressure zones.[10] The Main Campus also has an emergency water storage reservoir (a 1-million-gallon tank) in the upper campus that is available to provide the campus with an emergency water supply and to provide adequate fire flow to the Crown/Merrill Apartments.[11]

[10] Source: UC Santa Cruz Water Action Plan, December 2013.
[11] Source: University of California Santa Cruz Long-Range Development Plan 2005 - 2020, Final Environmental Impact Report (FEIR), Volume II, October 2005.

5.0 CITY OF SANTA CRUZ WATER DEMANDS

> *10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).*

The descriptions provided below for the City's water demands have been taken, for the most part, from the City's 2015 UWMP, which was adopted by City Council in May 2016. Supplemental information from other available reports has been included to provide the most recent data available.

5.1 Historical and Existing Water Demand

Historically, the general trend in the City's water demand was one in which water use rose roughly in parallel with account and population growth over time, except during two major drought periods in the late 1970s and the early 1990s. Around 2000, this pattern changed and system demand began a long period of decline, accelerated by pricing changes, drought, economic downturn, and other factors. In 2015, after two years of water rationing, annual water use fell to a level of about 2.45 billion gallons, similar to the level experienced during the 1970s drought.

Historical water demands for the UCSC Main Campus have also followed similar patterns, with water demands generally increasing each year, until the recent drought years when water use on the Main Campus dropped dramatically in response to the drought. From 2003 to 2008, annual water use on the Main Campus was about 200 MGY. In recent years, annual water use on the campus has dropped to as low as 151 MGY, representing a 25 percent reduction in water use in response to drought conditions. Historical annual water consumption on the Main Campus is shown in Figure 5-1.

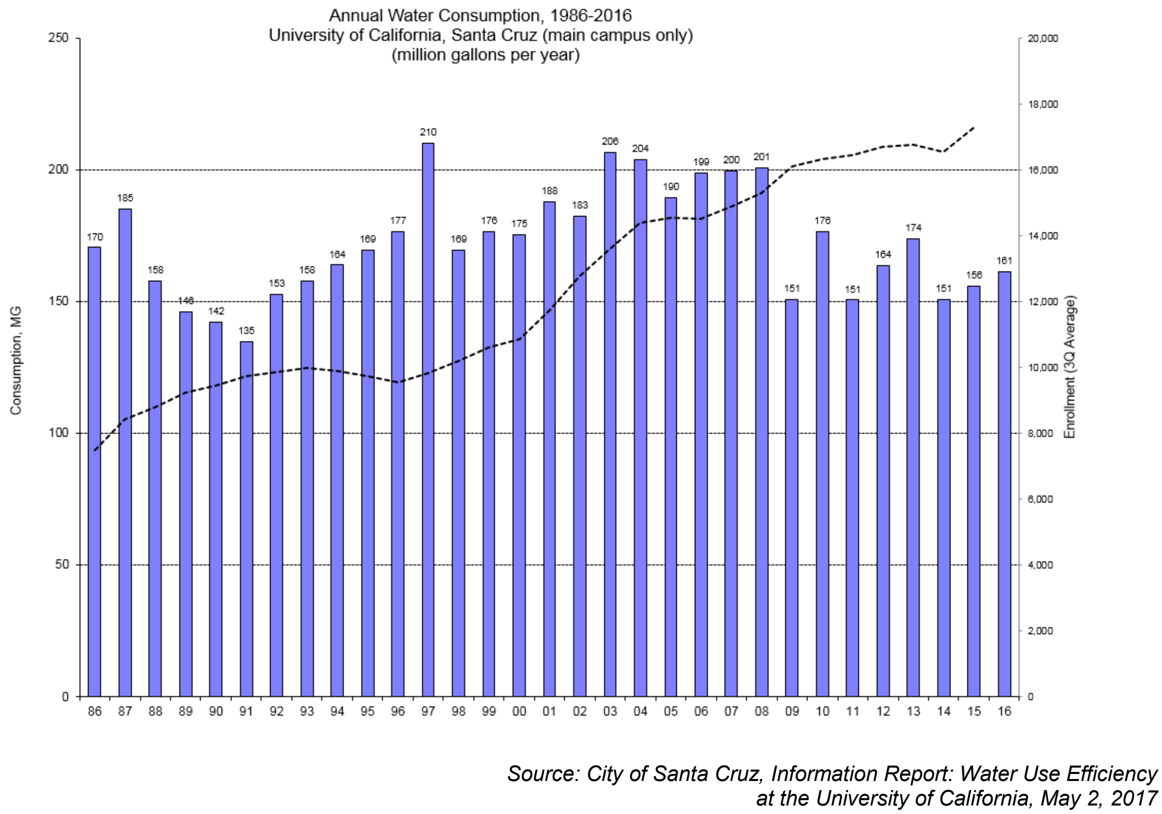


Figure 5-1. UCSC Main Campus Annual Water Consumption (1986-2016)

It is important to note that the recent decreases in campus water use have occurred despite increases in student enrollment. In 1986, the average amount of water use per enrolled student was about 60 gallons per day, while the current average water use per student is about 25 gallons per day.

5.2 Future Water Demand

The City utilized a demand model to forecast future demands for 2020 through 2035 in its 2015 UWMP, considering numerous factors including historical data on customer class water use, weather, price of water, household income, conservation, and other economic variables driving water demand. Table 5-1 provides a summary of the City's future water demand projections for its various water use types.

Table 5-1. City of Santa Cruz Projected Water Demand, MGY					
Use Type	2015	2020	2025	2030	2035
Single Family	835	1,277	1,223	1,191	1,170
Multi Family	538	772	714	690	678
Commercial	485	574	541	525	519
Industrial	43	56	59	60	61
UC Santa Cruz	**160**	**196**	**234**	**271**	**308**
Institutional/Governmental	35	46	42	40	40
Landscape (Dedicated Irrigation)	46	112	119	134	144
Landscape (Golf Irrigation)	87	58	52	47	47
Water Losses	223	236	241	247	253
Total	2,452	3,327	3,225	3,205	3,220

Source: City of Santa Cruz 2015 UWMP, Tables 4-1 and 4-3.

As described in Section 3.3, the water demands for UCSC included in the City's 2015 UWMP are based on the University's previously estimated buildout demand of 349 MGY[12]. The 349 MGY projection included the existing Main Campus water demand, the projected water demand estimated for the 2005 LRDP and 2008 Settlement Agreement, and existing and projected water demand for the University's Coastal Science Campus and the 2300 Delaware property.

As described in Section 3.3, the projected UCSC potable water demand through the buildout of facilities under the 2005 LRDP is now approximately 220 MGY; and buildout of the 2005 LRDP facilities is currently anticipated to occur by 2023. The currently projected water demand for the 2005 LRDP is considerably lower than the full development demand of 349 MGY previously estimated, and is consistent with the water demand projected for UCSC in the City's 2015 UWMP for the 2020 to 2025 time period (which ranged from 196 MGY in 2020 to 234 MGY in 2025).

[12] Based on the UCSC projected water demand developed for the City's SOI Amendment EIR (339 MGY) plus 10 MGY of additional water demands for additional development beyond 2020. Source: City of Santa Cruz SOI Amendment EIR Table 2-4 and City of Santa Cruz 2010 UWMP (page 4-19).

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6.0 WATER SUPPLIES

In 2001, the California Legislature passed Senate Bill 610 (Water Code Section 10910 et seq.) including the following provisions:

> *10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f) and (g).*
>
> *10910(d)(1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts*
>
> *10910(d)(2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following:*
>
> *(A) Written contracts or other proof of entitlement to an identified water supply.*
>
> *(B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.*
>
> *(C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.*
>
> *(D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.*
>
> *10910(e) If no water has been received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall also include in its water supply assessment pursuant to subdivision (c), an identification of the other public water systems or water service contract-holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has identified as a source of water supply within its water supply assessments.*

The descriptions provided below for the City’s water supplies have been taken, for the most part, from the City’s 2015 UWMP, which was adopted by City Council in May 2016. Although SB 610 applies only to cities and counties, and not to the University of California, supplemental information from other available reports has been included in this WSE to provide the most recent data available and to meet the specific requirements of SB 610.

6.1 Existing City Water Supplies

The Santa Cruz water system relies predominantly on local surface water supplies, which include the North Coast sources, the San Lorenzo River, and Loch Lomond Reservoir. The balance of the City’s supply comes from groundwater, all of which is extracted from wells in the Purisima Formation in the mid- County area. During the past decade, the North Coast sources represented 26 percent of the total water supply, the San Lorenzo River represented 55 percent, Newell Creek

(Loch Lomond Reservoir) represented 14 percent, and Live Oak (Beltz) wells contributed the remaining 5 percent.

All of the City's water resources are obtained from local sources. The system relies entirely on rainfall, surface runoff, and groundwater infiltration occurring within watersheds located in Santa Cruz County. No water is purchased from state or federal sources or imported to the region from outside the Santa Cruz area.

6.1.1 Surface Water Supplies

The City's surface water system supplies are located both within and outside of the City of Santa Cruz with a mix of flowing sources and a storage reservoir. Each of the surface water sources are briefly described in the following sections.

6.1.1.1 North Coast Creeks and Spring

The North Coast sources consist of surface diversions from three coastal streams and a natural spring located approximately six to eight miles northwest of downtown Santa Cruz. These sources are: Liddell Spring, Laguna Creek, Reggiardo Creek, and Majors Creek. The use of these sources by the City dates back as far as 1890.

6.1.1.2 San Lorenzo River

The San Lorenzo River is the City's largest source of water supply. The main surface water diversion is located at Tait Street near the City limits just north of Highway 1. Use of this source dates back to the 1870s and was consolidated under public ownership in 1917. The Tait Street Diversion is supplemented by shallow, auxiliary wells located directly across the river. These wells are potentially hydraulically connected to the river and tied to the City's appropriative rights for surface diversion. The drainage area above the Tait Street Diversion is 115 square miles.

The other diversion on the San Lorenzo River is Felton Diversion, which is an inflatable dam and intake structure built in 1974, located about six miles upstream from the Tait Street Diversion. Water is pumped from this diversion through the Felton Booster Station to Loch Lomond Reservoir. The facility is used to augment storage in the reservoir during dry years when natural inflow from Newell Creek is low.

While the City is the largest user of water from the San Lorenzo River basin, two other water districts, several private water companies and numerous individual property owners share the San Lorenzo River watershed as their primary source for drinking water supply.

6.1.1.3 Newell Creek and Loch Lomond Reservoir

Loch Lomond Reservoir is located near the town of Ben Lomond in the Santa Cruz Mountains. The reservoir was constructed in 1960 and has a maximum capacity of 2,810 million gallons (mg). In addition to providing surface water storage, the reservoir and surrounding watershed are used for public recreation purposes, including fishing, boating, hiking, and picnicking (swimming and wading are prohibited). The Newell Creek watershed above the reservoir is about nine square miles. In addition to the City, the San Lorenzo Valley Water District is entitled by contract to receive a portion of the water stored in Loch Lomond.

6.1.2 Groundwater

Even though groundwater constitutes only up to about 5 percent of the entire City water supply on an annual basis, it has been a crucial component of the water system for meeting peak season demands, maintaining pressure in the eastern portion of the distribution system, and for weathering periods of drought since the facilities were acquired from the Beltz Water Company in 1964.

6.1.2.1 City's Groundwater Facilities

The City's Live Oak Well system consists of four production wells and two water treatment plants located in the eastern portion of the City water service area. The facilities were originally acquired by the City from the Beltz Water Company in 1964, and are still referred to as the "Beltz" wells. Wells 8 and 9 were installed in 1998 as replacement wells for Wells 1 and 2, which were damaged in the 1989 Loma Prieta earthquake. Well 7, which began operating in 1974, has been replaced by Well 10. The newest well, Beltz 12 and associated water treatment facilities, were completed in 2015.

6.1.2.2 Basin Description

The geographical area from which the City pumps groundwater is identified as the *West Santa Cruz Terrace Groundwater Basin* (Basin Number 3-26), whose western and eastern boundaries coincide roughly with the City's water service area (CA DWR, Bulletin 118). The entire production of the City's Live Oak well field is derived from the Purisima Formation, which is the primary groundwater aquifer underlying the entire Mid-county region and makes up most of what is commonly referred to elsewhere as the "Soquel-Aptos" basin. Groundwater from the Purisima Formation is used by the City, the Soquel Creek and Central Water Districts, several small water systems, and numerous private rural water wells.

6.1.2.3 Groundwater Management

The City of Santa Cruz Water Department has not itself prepared a groundwater management plan; however, a groundwater management plan has been prepared by the Soquel Creek and Central Water Districts for the Soquel-Aptos area consistent with Assembly Bill 3030. This plan was originally prepared in 1996, updated in 2007, and currently serves as a living document with the most recent update having occurred in 2013.

As part of the region's compliance with the Sustainable Groundwater Management Act (SGMA), the Soquel-Aptos Groundwater Management Committee (SAGMC) was formed in 2015 and includes representatives from the County of Santa Cruz, Central Water District, Soquel Creek Water District, the City of Santa Cruz and private well owners. The SAGMC established a Groundwater Sustainability Agency Formation Subcommittee and appointed six members. Following the framework provided by the state, the subcommittee was charged with creating an approved Groundwater Sustainability Agency prior to the June 2017 deadline. Additional activities recently initiated by the SAGMC include requesting a basin boundary modification, developing quarterly monitoring reports, conducting an evaluation of shallow wells, and making progress on a comprehensive groundwater model by integrating information available for the entire management area.

The request for a basin boundary modification was approved in 2016 and the new basin is called the Santa Cruz Mid-County Groundwater Basin (Basin Number 3-001). This new basin includes the following previously defined basins:

- Basin Number 3-01 Soquel Valley
- Basin Number 3-02 Pajaro Valley
- Basin Number 3-21 Santa Cruz Purisima Formation
- Basin Number 3-26 West Santa Cruz Terrace

6.1.2.4 Overdraft Conditions

In July 2015, the Soquel-Valley Groundwater Basin (Basin Number 3-01) was identified by the California Department of Water Resources as one of 21 groundwater basins to be reclassified as critically overdrafted. This was done based on seawater intrusion detected at the coastline, and the local declaration of a Groundwater Emergency by Soquel Creek Water District in 2014. The Pajaro Valley Groundwater Basin (Basin Number 3-04) was already on DWR's list of critically overdrafted basins (as identified in DWR Bulletin 118-1980). Because those basins are part of the newly defined Santa Cruz Mid-County Groundwater Basin, the newly defined Santa Cruz Mid-County Groundwater Basin is now included on DWR's list of critically overdrafted basins.

6.1.2.5 Groundwater Pumping

In 2010, the City was advised by its hydrogeologist that the yield of the Live Oak (Beltz) well field was substantially less than half the 420 MGY annual production that the City had long assumed for water supply planning purposes, and that the dry season pumping rate that can be sustained without causing seawater intrusion in average years was closer to 170 MGY. As a direct result of these findings, the City relocated pumping further inland to a new well site. This unexpected loss of drought year groundwater yield is emblematic of the continuing change and uncertainty facing the City in its effort to provide a safe, reliable, and adequate municipal water supply.

Table 6-1 below shows the actual volume pumped from the City's well fields during the peak season over the last five years. Average volume over this time is 164 MGY. As a result of the hydrogeology work, the City has limited groundwater pumping to a volume far below 420 MGY level. The current agreed upon sustainable yield volume is 170 MGY and has been utilized by the City when planning for the operation of the well fields. Due to the severe drought conditions in 2014, the City did rely on groundwater for a somewhat higher volume to meet peak demand in the dry summer months.

Table 6-1. City of Santa Cruz Groundwater Volume Pumped					
	2011	2012	2013	2014	2015
West Santa Cruz Terrace Groundwater Basin (Basin 3-26), MGY	163	163	160	188	145

Source: City of Santa Cruz 2015 UWMP, Table 6-1.

6.2 Additional Planned Future City Water Supplies

6.2.1 Transfers and Exchanges

Following years of discussion and coordination on groundwater management, the City and Soquel Creek Water District recently signed a "Cooperative Water Transfer Pilot Project for Groundwater Recharge and Water Resource Management" agreement to transfer a small amount of water to Soquel Creek Water District in the winter months when surface water from the North Coast is available. This transfer would allow the District to assess the effects of reduced pumping of the basin. The agreement is a first step in the implementation of the Water Supply Augmentation Strategy and serves to further study and determine the potential benefits of local exchanges and transfers as a groundwater management tool and supply reliability strategy.

6.2.2 Recycled Water

Over the years, the City has commissioned several engineering studies regarding the potential uses of recycled water for agricultural irrigation, landscape irrigation, groundwater recharge, direct potable reuse, and use of recycled water from neighboring water districts. The City of Santa Cruz is actively investigating the feasibility of a recycled water program through a regional Recycled Water Facilities Planning Study, funded in part by a grant from the State Water Board Division of Financial Assistance, Water Recycling Funding Program. The planning study is scheduled to be completed in 2017. In the meantime, the City is actively pursuing two recycled water projects: 1) a bulk recycled water fill station and pilot City park irrigation project adjacent to the WWTF, and 2) supporting delivery of recycled water from Scotts Valley to the Pasatiempo Golf Course.

6.2.3 Desalination

For a decade or more, the City had been pursuing a 2.5 mgd desalination facility as a regional project with Soquel Creek Water District to diversify both agencies' water supply portfolio. It remains a possible project for the City. In the recently completed Final Report on Agreements and Recommendations, the Water Supply Advisory Committee presented a supply strategy that includes desalinated water, but only as a last resort, and after exhausting several other preferred options (City of Santa Cruz, 2015). Soquel Creek Water District is continuing to consider desalinated water through a Memorandum of Interest with a different regional "Deepwater Desal" project proposed at Moss Landing Harbor.

6.3 Summary of Existing and Additional Planned Future City Water Supplies

Table 6-2 provides a summary of the City's existing and projected water supplies in normal years.

Table 6-2. City of Santa Cruz Existing and Projected Normal Year Water Supplies, MGY

Supply Source	2015	2020	2025	2030	2035
North Coast Surface Water Sources	382	637	642	671	671
San Lorenzo River	1,458	1,882	1,842	1,829	1,834
Loch Lomand Reservoir	495	595	551	540	547
Groundwater (Live Oak/Beltz Wells)	145	138	129	127	128
Total	2,480	3,252	3,164	3,167	3,180

Source: City of Santa Cruz 2015 UWMP, Tables 6-9 and 6-10.

6.4 Proposed UCSC Recycled Water Supplies

As described above in Section 2.3.2, UCSC is proposing to construct a membrane bioreactor (MBR) wastewater treatment facility as part of the proposed Student Housing West project that would treat wastewater and generate recycled water for use on the Heller site and, potentially, in existing student residence halls at Porter College. Wastewater generated on the Heller site would be collected via an underground sewer line system constructed as part of the proposed project and would be conveyed to a wastewater treatment facility that would be located in the southeastern portion of the Heller site.

Recycled water (treated effluent) generated at the MBR plant would be pumped into a recycled water main and distribution system ("purple" pipes) and conveyed throughout the Heller site development to provide water for toilet flushing and landscape irrigation. Recycled water would also be conveyed north via a recycled water main that would be located in the utility corridor extending between the Kresge parking lot and the Heller site. The main would convey recycled water to Porter College where the residence halls are already fitted with dedicated purple pipes for toilet flushing and landscape irrigation.

7.0 DETERMINATION OF WATER SUPPLY SUFFICIENCY BASED ON THE REQUIREMENTS OF SB 610

Water Code section 10910 states:

> *10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.*

7.1.1 Overview of Water Supply Constraints

The City of Santa Cruz is facing several obstacles in meeting its present and future water supply needs. While each complication presents a unique set of water management challenges, the common theme is the limitation in where, when, and how much water is available to meet the area's water service needs, particularly during years when rainfall is below average. The constraints include the following:

- **Local Supply Variability:** The City water system draws almost exclusively on local surface water sources; whose yield varies from year to year depending on the amount of rainfall received during the winter season and generated runoff that provides beneficial inflows. This local variation has been a significant constraint in recent years as the Central Coast, and the State of California more generally, were held in the grip of a multi-year drought. Declaration of a local water shortage emergency for the past two years underscores the effect of the drought on the City of Santa Cruz system.
- **Ecosystem Restoration and Protected Species:** Since 2002, the City of Santa Cruz has been working toward the development of a Habitat Conservation Plan (HCP) that covers operation and maintenance activities at the North Coast streams and San Lorenzo River diversions as well as other activities which may result in "take" of threatened and/or endangered species. An HCP is an operational avoidance and minimization and mitigation plan prepared under Section 10 of the Federal Endangered Species Act (FESA) and Section 2081 of the California Endangered Species Act (CESA) by nonfederal parties seeking to obtain a permit for incidental take of federally or state-listed threatened and endangered species.
- **Source Water Quality and Treatment Capacity:** The primary issues with respect to water quality are the treatment challenges posed by future changes in the source water mix driven in part by ecosystem protection requirements. The Graham Hill Water Treatment Plant is a conventional surface water treatment plant that was commissioned in 1960 as a 12 mgd plant and has undergone an expansion and a number of improvements over the last 50 years. Except for groundwater from the Live Oak wells, all water delivered through the City system is treated at this plant. In other words, it must operate properly 100 percent of the time to maintain water service throughout the entire system.

- **The Water Rights Conformance Project for Water Rights and Entitlements:** The Newell Creek and San Lorenzo River permits to divert at Felton were originally granted as "diversion to storage," rather than as "direct diversion" rights. A diversion to storage is used when the water diverted is put into storage and is retained in storage for some time prior to being used. Current State Water Resources Control Board practice, however, requires rights of "direct diversion" as well as diversion to storage for the same operations as the City originally proposed and has historically undertaken.

7.1.2 Water Supply Availability and Reliability

The City of Santa Cruz utilizes the Confluence model to analyze the variability of water supplies to determine potential water supply shortages. The City has been utilizing the Confluence model to support water supply planning activities since 2003 and this model was used to generate the results for the 2010 UWMP (City of Santa Cruz, 2011). The model takes into account the variation in demand both within and between years, the availability of water from various sources, and the capacity of infrastructure to pump and treat the water. As described in Chapter 7 of the City's 2015 UWMP, the results presented below provide perspective on the City's water supply reliability based on accepted planning criteria and projected conditions in the water system.

7.1.2.1 Normal Year Supply and Demand Comparison

Although the City has not previously seen shortages in normal water years, by adding the ecosystem protection conditions likely to begin prior to 2020 (e.g., the HCP described above) a small shortage (1 to 3 percent) can be reasonably expected in future normal years. Historically in normal water years, the City experienced a slight surplus of supply and this trend can be expected to continue until the HCP agreement is approved and higher instream flows are maintained. As the City chose to create a representative average year by using the historic record, the inclusion of the dry years and critically dry years within the average may explain the predicted small deficit. It is important to note that the City predicts the supply and demand volumes to be in balance for 90 percent of all normal water years for 2020-2035.

7.1.2.2 Single Dry Year Supply and Demand Comparison

The City's single dry year assessment in their 2015 UWMP was based on the water supply available to the City comparable to water year 2014, which was a recent critically dry year. Based on these supply assumptions, water supply during a single dry year is not sufficient to meet the demand in the near-term, although the shortage experienced is projected to decrease over time. During a single dry year, annual shortages of 16 to 21 percent are projected given the modelled supply and demand figures developed for planning and reliability purposes.

7.1.2.3 Multiple Dry Year Supply and Demand Comparison

In the City's 2015 UWMP, the City chose to present the estimated water supply available during the multiple dry water year period of a three-year drought sequence using hydrology from 1976, 1977, and a second 1977 year. In an extreme multi-year drought similar to the 1976-77 event, the estimated water supply available to the City in the first year of that event, according to the model, ranges between 2,430 and 2,377 or an average of 25 percent less water on an annual basis than is available in a normal water year. During the second year, the average shortage over time increases to 39 percent and in the third year modeled, the average reduction compared to a normal year is over 50 percent.

Table 7-1 presents a summary of the City's projected demands and available supplies under normal year, single dry year and multiple dry year conditions.

Table 7-1. City of Santa Cruz Water Supply and Demand in Normal Years, Single Dry Years and Multiple Dry Years, MGY

	2020	2025	2030	2035
Normal Year				
Supply Totals	3,252	3,164	3,167	3,180
Demand Totals	3,327	3,225	3,205	3,220
Difference	(75)	(61)	(38)	(40)
Demand Served, %	97%	97%	98%	98%
Single Dry Year				
Supply Totals	2,619	2,658	2,692	2,692
Demand Totals	3,327	3,225	3,205	3,220
Difference	(708)	(567)	(513)	(528)
Demand Served, %	79%	82%	84%	84%
Multiple Dry Years				
First Year				
Supply Totals	2,430	2,377	2,377	2,381
Demand Totals	3,327	3,225	3,205	3,220
Difference	(897)	(848)	(828)	(839)
Demand Served, %	73%	74%	74%	74%
Second Year				
Supply Totals	1,918	1,942	1,968	1,969
Demand Totals	3,327	3,225	3,205	3,220
Difference	(1,409)	(1,283)	(1,237)	(1,251)
Demand Served, %	58%	60%	61%	61%
Third Year				
Supply Totals	1,597	1,567	1,580	1,581
Demand Totals	3,327	3,225	3,205	3,220
Difference	(1,730)	(1,658)	(1,625)	(1,639)
Demand Served, %	48%	48%	49%	49%

Source: City of Santa Cruz 2015 UWMP, Tables 7-2, 7-3 and 7-4

7.1.3 City of Santa Cruz Water Supply Advisory Committee and Water Supply Augmentation Plan

In early 2014, City Council appointed members to the Water Supply Advisory Committee (WSAC). The aim of the WSAC process was to:

1. Explore the City's water profile, including supply, demand, and future risks;
2. Analyze potential solutions to deliver a safe, adequate, reliable, affordable, and environmentally sustainable water supply; and
3. Develop recommendations for City Council consideration.

In late 2015, consensus was achieved among WSAC members for how best to address an agreed-upon worst year gap of 1.2 billion gallons between water supply and water demand during times of extended drought. In November 2015, the City Council adopted the recommendations of the WSAC to address these challenges. These recommendations are:

- **Strategy 0 – Conservation:** Enhance the City's existing conservation programs with new programs such as increased rebates and better management of peak season demand, with the goal of further reducing demand by 200 to 250 MGY by 2035, with a particular focus on reducing demand during the peak season.
- **Strategy 1 – Groundwater Storage: In Lieu Water Exchanges:** Deliver available winter flows to the neighboring Soquel Creek Water District or Scotts Valley Water District, thereby reducing pumping from regional aquifers. Winter flows would also be injected into aquifers through new and existing wells. This would result in a bank of water to be extracted and returned to the City when needed in future dry years.
- **Strategy 2 – Advanced Treated Recycled Water or Desalinated Water:** This strategy would provide a supplemental or replacement supply if Strategy 1 is ineffective in terms of cost-effectiveness, timeliness, or yield.

Although the City has adopted the recommendations of the WSAC, there remains uncertainty as to whether the conservation programs and groundwater storage/in-lieu water exchanges will prove effective. If they do not, there are numerous technical, financial, and regulatory considerations which remain to be addressed before the City could develop a recycled or desalinated water treatment system.

7.1.4 City of Santa Cruz Water Shortage Contingency Plan

The City's Water Shortage Contingency Plan has a five-stage plan to correspond with supply reductions from less than 5 percent to 50 percent. Each stage includes a set of demand reduction measures that become progressively more stringent as the shortage condition escalates.

The City's strategy for dealing with water shortages of all levels involves the following interrelated components:

- An allocation system to establish reduction goals for different customer groups;
- Demand reduction measures;
- Publicity and communications; and
- Operating actions.

The City's Water Shortage Contingency Plan includes reduction goals for UCSC under each shortage scenario. These goals were developed in consultation with UCSC. UCSC reached, and even exceeded its reduction targets in 2010 and 2014 when the City implemented the Plan. In 2015, UCSC reduced its peak season water use by almost 18 percent. In addition, UCSC has been implementing water conservation measures, including improvements to irrigation systems and retrofitting restroom fixtures, which have contributed to a reduction in per capita water use. UCSC reduced annual per capita water use nearly 36 percent from the period between 2002 and 2005, to 2011-12. UCSC is planning additional fixture retrofits and infrastructure improvements which will further increase the efficiency of water use on the campus.

7.1.5 UC Santa Cruz Water Conservation Measures

As described in a May 2017 City of Santa Cruz Information Report to the City Manager[13], the UCSC has successfully met the City's recent mandatory water reduction goals as a result of close collaboration between the representatives of all sectors across the campus, as well as with the City Water Department. In both 2014 and 2015, a "Water Working Group" led by the campus planning and sustainability offices established monthly budgets and directed efforts to reduce water use by 20 percent, or about 20 million gallons, during the peak dry season. A key to the success of this effort was an investment in new cellular-based meter reading technology that allowed individual building/facility managers to view their water consumption on an hourly basis and quickly detect leaks. This technology will continue to help the University manage the campus water use well into the future. A water conservation student intern also helped communicate the conservation message to students and staff and helped identify and report leaks. For its efforts, UCSC established itself as a leader in water conservation and water efficiency among the other UC and other college campuses across the state.

[13] City of Santa Cruz, Information Report: Water Use Efficiency at the University of California, May 2017; copy included in Appendix B.

Consistent with state law that set a goal to reduce per capita water use by 20 percent in 2020[14], the UC Board of Regents in 2011 set a similar policy directing each campus to strive to reduce potable water consumption adjusted for campus population growth by 20 percent in 2020. To this end, in 2013 UCSC prepared a Water Action Plan that recognizes the limited nature of water resources in the Santa Cruz region and the campus' role as a responsible steward in the community. The plan uses a "weighted campus user" baseline that normalizes for differences in water use between the number of on- and off-campus students, and full time vs. part time students, faculty, and staff.

In 2016, the UC Office of the President adopted a more ambitious goal mirroring a 2015 Executive Order covering federal facilities. It calls for campuses to demonstrate leadership in the area of sustainable water systems by reducing potable water use 35 percent by 2025, as compared to a 2005-2008 baseline period, using the same weighted campus user approach. Some of the actions called out in the policy include:

- Converting potable water used for irrigation to recycled water;
- Implementing efficient irrigation systems;
- Drought tolerant plant selections;
- Phasing out unused turf; and
- Replacing single-pass cooling systems or constant flow laboratory equipment.

UCSC is currently in the process of preparing an updated Water Action Plan that will address how it intends to meet this goal.

As described in previous sections, UCSC is proposing to construct a membrane bioreactor (MBR) wastewater treatment facility as part of the proposed Student Housing West project that would treat wastewater and generate recycled water for use on the Heller site and, potentially, in existing student residence halls at Porter College. Recycled water (treated effluent) generated at the MBR plant would provide water for toilet flushing and landscape irrigation at the Heller site. Recycled water would also be conveyed north via a recycled water main that would be located in the utility corridor extending between the Kresge parking lot and the Heller site. The main would convey recycled water to Porter College where the residence halls are already fitted with dedicated purple pipes for toilet flushing and landscape irrigation. Use of recycled water for these purposes will offset or reduce potable water use, consistent with the University's policies for sustainable water use.

[14] The Water Conservation Act of 2009 (also known as SB X7-7); 20 percent reduction is based on historical baseline water use established for a 10-year continuous baseline period ending no earlier than December 31, 2004 and no later than December 31, 2010 based on guidelines set forth in the SB X7-7 provisions.

8.0 EVALUATION FINDINGS

The purpose of this Water Supply Evaluation was to perform an evaluation of the availability and reliability of water supplies to serve the development completed to date and remaining planned development under the UCSC 2005 LRDP based on existing UCSC water demands and projected water demands for remaining projects to be developed under the 2005 LRDP. Key findings of this Water Supply Evaluation are summarized as follows:

- Water demands on the UCSC Main Campus and at the Coastal Science Campus have dropped dramatically in recent years as a result of water conservation measures in response to the recent drought. Many of the water conservation measures have resulted in permanent reductions in water use (e.g., plumbing fixture retrofits, improvements in leak detection, etc.);
- In the recent drought years, UCSC has successfully met the City's mandatory water reduction goals as a result of close collaboration between representatives of all sectors across campus, as well as with the City Water Department;
- Some development has already occurred on the UCSC Main Campus under the 2005 LRDP; however, development to date has been significantly less than originally planned;
- The projected potable water demands for all UCSC facilities, including the buildout of facilities under the UCSC 2005 LRDP, are now projected to be approximately 220 MGY by 2023, which includes the following:
  - Existing water demands for the Main Campus, the 2300 Delaware property, and the Coastal Science Campus,
  - Projected additional water demands for the 2300 Delaware property and the Coastal Science Campus, and
  - Projected additional water demands for the remaining planned development under the 2005 LRDP, including the Student Housing West project;
- The currently projected water demand of approximately 220 MGY in 2023 for the 2005 LRDP is considerably lower than the full development demand of 349 MGY previously estimated, and is consistent with the water demand projected for UCSC in the City's 2015 UWMP for the 2020 to 2025 time period (which ranged from 196 MGY in 2020 to 234 MGY in 2025); and
- As described in Section 7 of this Water Supply Evaluation, the City does project water supply shortages during dry years in its 2015 UWMP. As a City water customer, UCSC is subject to these potential water shortages and is subject to the City's water supply allocation system and demand reduction measures. As described, UCSC has been very successful in reducing water use in recent years in response to the drought, and is actively developing an updated Water Action Plan to implement additional measures to reduce potable water use.

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APPENDIX A

Water Use Estimates for Student Housing West Project

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UC Santa Cruz Student Housing West Project -- Heller Site

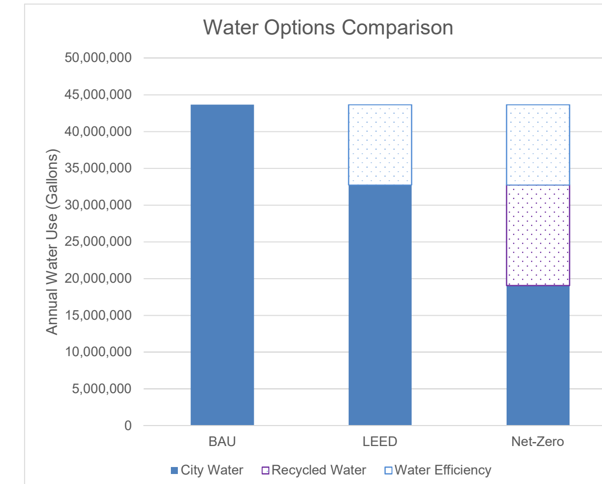
(Source: Puttman Infrastructure, Inc. January 2018)

Summary (draft)

Water Use Comparison

User	BAU Daily Water Use (gpd)	BAU Annual Water Use (gal)	Water Efficiency Reduction (%)	WE Reduction (gpd)	Daily Water Use (gpd)	Daily Sewer Generation (gpd)	Occupied Days	Annual Water Use (gal)	Annual Sewer Generation (gal)	RW Production (gpd)	RW Use (gpd)	Annual RW Use (gal)	BAU Water Use minus WE and RW (gpd)	Annual BAU Water Use minus WE and RW (gal)	Total Water Use Reduction from BAU (%)
Bldg 1	34,775	9,483,109	25%	8,694	26,081	24,255	273	7,112,332	6,614,468	24,255	9,613	2,621,411	16,468	4,490,921	53%
Bldg 2	16,577	4,520,576	25%	4,144	12,433	11,563	273	3,390,432	3,153,102	11,563	4,582	1,249,620	7,850	2,140,812	53%
Bldg 3	28,385	7,740,540	25%	7,096	21,289	19,798	273	5,805,405	5,399,027	19,798	7,846	2,139,713	13,442	3,665,692	53%
Bldg 4	18,439	5,028,194	25%	4,610	13,829	12,861	273	3,771,146	3,507,166	12,861	5,097	1,389,941	8,732	2,381,205	53%
Bldg 5	31,172	8,500,704	25%	7,793	23,379	21,743	273	6,375,528	5,929,241	21,743	8,617	2,349,845	14,762	4,025,683	53%
Bldg 6	6,946	2,481,356	25%	1,736	5,209	4,845	357	1,861,017	1,730,746	4,845	1,920	685,920	3,289	1,175,097	53%
Bldg 7	6,946	2,481,356	25%	1,736	5,209	4,845	357	1,861,017	1,730,746	4,845	1,920	685,920	3,289	1,175,097	53%
Irrigation	9,375	3,421,988	25%	2,344	7,031	0	365	2,566,491	0	-	7,031	2,566,491	0	0	100%
Porter Bldgs															
Kresge															
Other															
Total	**152,614**	**43,657,825**		**38,154**	**114,461**	**99,909**	**2,443**	**32,743,368**	**28,064,496**	**99,909**	**46,627**	**13,688,861**	**67,834**	**19,054,507**	56%

	BAU	LEED	Net-Zero
City Water	43,657,825	32,743,368	19,054,507
Water Efficiency	0	10,914,456	10,914,456
Recycled Water	0	0	13,688,861
Total	43,657,825	43,657,825	43,657,825



Notes:
1. Daily Water Use values from Interface estimate
2. RW Use values from Puttman adjusted estimate
3. Offsite RW demand from Porter, Kresge, Other TBD

Building Water Use Estimates (Puttman)

Preliminary Adjusted Water Use Estimate

				Toilet/Urinal					**Shower**				**Kitchen Sink**				**Lavatory**				**Laundry**			**Total**			
Building	Description	Units	Beds	Toilet uses/day	flush rate (GPF)	Urinal Uses	Flush Rate (gpf)	Water use per day (gal)	Shower uses/day	Flow rate (GPM)	Duration (minutes)	Water use per day (gal)	Sink uses/day	Flow rate (GPM)	Duration (minutes)	Water use per day (gal)	Lav uses/day	Flow rate (GPM)	Duration (minutes)	Water use per day (gal)	loads/occupant /week	water/load (gal)	Ave. water use per day (gal)	Ave. water use per day (gal/day)	Total GPD / Person	NP Total Ave Water use / day	NP GPD / Person
1	7/9 Levels (Undergrad)		751	10	1.28			9,613	1	1.3	10	9,763	3	1.5	1	3,380	3	1	1	2,253	1	10	1,073	26,081	34.7	9,613	12.8
2	5/7 Levels (Undergrad)		358	10	1.28			4,582	1	1.3	10	4,654	3	1.5	1	1,611	3	1	1	1,074	1	10	511	12,433	34.7	4,582	12.8
3	7/9 Levels (Undergrad)		613	10	1.28			7,846	1	1.3	10	7,969	3	1.5	1	2,759	3	1	1	1,839	1	10	876	21,289	34.7	7,846	12.8
4	5/7 Levels (Undergrad)		362	10	1.28			4,634	1	1.3	10	4,706	3	1.5	1	1,629	3	1	1	1,086	1	10	517	12,572	34.7	4,634	12.8
	Common Areas							463				471				163				109			52	1,257		463	
5	5/7 Levels (Undergrad)		612	10	1.28			7,834	1	1.3	10	7,956	3	1.5	1	2,754	3	1	1	1,836	1	10	874	21,254	34.7	7,834	12.8
	Common Areas							783				796				275				184			87	2,125		783	
6	4 Levels (Graduate)		150	10	1.28			1,920	1	1.3	10	1,950	3	1.5	1	675	3	1	1	450	1	10	214	5,209	34.7	1,920	12.8
7	4 Levels (Graduate)		150	10	1.28			1,920	1	1.3	10	1,950	3	1.5	1	675	3	1	1	450	1	10	214	5,209	34.7	1,920	12.8
			2,996					39,596				40,214				13,920				9,280			4,419	107,429	35.9	39,596	13.2

Non-Potable water demand per day (gal/day)	39,596
Non-Potable water demand per month (gal/month)	**1,187,866**
Potable water demand per day (gal/day)	67,834
Potable water demand per month (gal/month)	**2,035,015**

Notes:
1. Interface value for total water use utilized in calculations. Average GPD matched assumption from other engineer and metered use from existing buildings
2. Puttman adjusted value for toilet flushing utilized in calculations.
3. # of beds in Buildings 6 & 7 increased to 150 to account for graduate student housing extra occupants.
4. 10% increase added to Buildings 4 & 5 to account for common areas.

Background Information (Interface/LEED, UCSC, and West Yost)

Preliminary Water Use Estimate (From Interface 12/4/17)

				Toilet/Urinal					**Shower**				**Kitchen Sink**				**Lavatory**				**Laundry**			**Total**				
Building	Description	Units	Beds	Toilet uses/day	flush rate (GPF)	Urinal Uses	Flush Rate (gpf)	Water use per day (gal)	Shower uses/day	Flow rate (GPM)	Duration (minutes)	Water use per day (gal)	Sink uses/day	Flow rate (GPM)	Duration (minutes)	Water use per day (gal)	Lav uses/day	Flow rate (GPM)	Duration (minutes)	Water use per day (gal)	loads/occupant /week	water/load (gal)	Ave. water use per day (gal)	Ave. water use per day (gal/day)	Ave. water use per day (CHECK) (gal/day)	Total GPD / Person	NP Total Ave Water use / day	NP GPD / Person
1	7/9 Levels		751	5	1.28			4,806	1	1.5	10	11,265	4	1.5	1	4,506	5	1	1	3,755	1	13	1,395	25,727	25,727	34.3	4,806	6.4
2	5/7 Levels		358	5	1.28			2,291	1	1.5	10	5,370	4	1.5	1	2,148	5	1	1	1,790	1	13	665	12,264	12,264	34.3	2,291	6.4
3	7/9 Levels		613	5	1.28			3,923	1	1.5	10	9,195	4	1.5	1	3,678	5	1	1	3,065	1	13	1,138	21,000	21,000	34.3	3,923	6.4
4	5/7 Levels		362	5	1.28			2,317	1	1.5	10	5,430	4	1.5	1	2,172	5	1	1	1,810	1	13	672	12,401	12,401	34.3	2,317	6.4
5	5/7 Levels		612	5	1.28			3,917	1	1.5	10	9,180	4	1.5	1	3,672	5	1	1	3,060	1	13	1,137	20,965	20,965	34.3	3,917	6.4
6	4 Levels		101	5	1.28			646	1	1.5	10	1,515	4	1.5	1	606	5	1	1	505	1	13	188	3,460	3,460	34.3	646	6.4
7	4 levels		105	5	1.28			672	1	1.5	10	1,575	4	1.5	1	630	5	1	1	525	1	13	195	3,597	3,597	34.3	672	6.4
			2,902					18,573				43,530				17,412				14,510			5,389	99,414	99,414	34.3	18,573	6.4

Non-Potable water demand per day (gal/day)	18,573
Non-Potable water demand per month (gal/month)	**557,184**
Potable water demand per day (gal/day)	80,841
Potable water demand per month (gal/month)	**2,425,243**

Existing Campus Housing 2015-16 Water Use (from UCSC)

Area	# of Beds	Annual Use (gal)	Annual Gal per Bed	GPD per Bed
Coll 9/10 (not incl multipurpose room)	353	2,762,773	7,827	31.0
Rachel Carson Coll	318	1,922,609	6,046	24.0
Cowell Apts	196	1,742,527	8,890	35.2
Crown Faculty Apts	7	51,365	7,338	20.5
CMA	471	3,868,673	8,214	32.5
Oakes	397	3,931,564	9,903	39.2
Porter/Kresge Infill	360	1,526,969	4,242	16.8
RW Grove	151	1,428,328	9,459	37.5
Stevenson Apts	176	1,681,263	9,553	37.8
Family Student Housing	196	7,197,915	36,724	102.8
Graduate Housing	82	1,014,152	12,368	34.6

West Yost Assumptions

Building Type	# of Beds	Annual Use (gal)	Annual Gal per Bed	GPD per Bed
Undergraduate	2675	23,433,000	8,760	34.7
Graduate Housing	200	2,774,000	13,870	38.0
Family Student Housing	125	5,155,625	41,245	113.0

Notes:
1. For typical apartments, # of occupied days calculated per Existing Building schedule.
2. For faculty, grad, and FSH, assumed year-round occupancy, used schedule for Bldgs 6-7

Irrigation Estimates (from Walker Macy)

Irrigation Use from Walker Macy (12/4/17)

Month	Gallons	Days	GPD
Jan	25,297	31	816
Feb	34,272	28	1,224
Mar	63,239	31	2,040
Apr	238,678	30	7,956
May	360,052	31	11,615
Jun	416,153	30	13,872
Jul	404,731	31	13,056
Aug	379,435	31	12,240
Sep	318,236	30	10,608
Oct	227,661	31	7,344
Nov	73,440	30	2,448
Dec	25,297	31	816
Total	2,566,491	365	7,031

Building Occupany Assumptions (from Capstone)

Occupied Days Estimates

Buildings 1-5 Occupied Days

Month	Days	Occupation	Occupied Days
Jan	31	100%	31
Feb	28	100%	28
Mar	31	100%	31
Apr	30	100%	30
May	31	100%	31
Jun	30	66%	20
Jul	31	25%	8
Aug	31	25%	8
Sep	30	33%	10
Oct	31	100%	31
Nov	30	100%	30
Dec	31	50%	16
Total Occupied Days			**273**

Buildings 6-7 Occupied Days

Month	Days	Occupation	Occupied Days
Jan	31	100%	31
Feb	28	100%	28
Mar	31	100%	31
Apr	30	100%	30
May	31	100%	31
Jun	30	100%	30
Jul	31	100%	31
Aug	31	100%	31
Sep	30	100%	30
Oct	31	100%	31
Nov	30	100%	30
Dec	31	75%	23
Total Occupied Days			**357**

Existing Campus Housing Days

Month	Days	Occupation	Occupied Days
Jan	31	100%	31
Feb	28	100%	28
Mar	31	100%	31
Apr	30	100%	30
May	31	100%	31
Jun	30	50%	15
Jul	31	0%	0
Aug	31	0%	0
Sep	30	33%	10
Oct	31	100%	31
Nov	30	100%	30
Dec	31	50%	16
Total Occupied Days			**252**

Notes:
1. Buildings 6 & 7 occupied 12 months
2. Buildings 1-5 fully occupied late Sept through late June
3. Assume 25% occupancy for buildings 1-5 in July and August

UC Santa Cruz Student Housing West Project -- Hagar Site

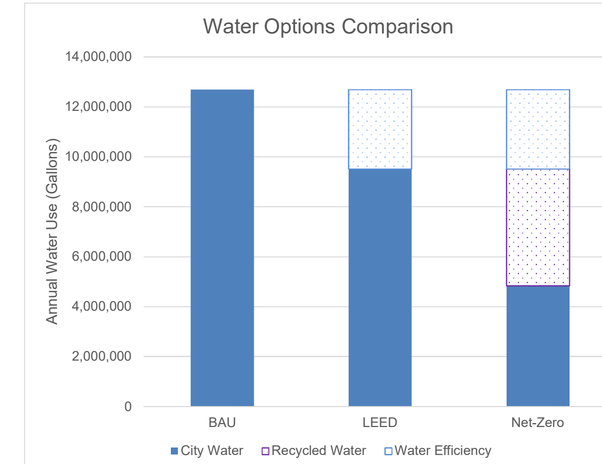
(Source: Puttman Infrastructure, Inc. January 2018)

Summary (draft)

Water Use Comparison

User	BAU Daily Water Use (gpd)	BAU Annual Water Use (gal)	Water Efficiency Reduction (%)	WE Reduction (gpd)	Daily Water Use (gpd)	Daily Sewer Generation (gpd)	Occupied Days	Annual Water Use (gal)	Annual Sewer Generation (gal)	RW Production (gpd)	RW Use (gpd)	Annual RW Use (gal)	BAU Water Use minus WE and RW (gpd)	Annual BAU Water Use minus WE and RW (gal)	Total Water Use Reduction from BAU (%)
FSH	20,559	7,344,815	25%	5,140	15,419	14,340	357	5,508,611	5,123,008	14,340	5,683	2,030,323	9,736	3,478,288	53%
Childcare	1,923	686,913	25%	481	1,442	1,341	357	515,185	479,122	1,341	653	233,213	789	281,972	59%
Irrigation	12,772	4,661,689	25%	3,193	9,579	0	365	3,496,267	0	-	9,579	3,496,267		1,071,855	77%
City Make-Up												1,071,855			
Total	**35,254**	**12,693,418**		**8,813**	**26,440**	**15,681**	**1,080**	**9,520,063**	**5,602,131**	**15,681**	**15,915**	**4,687,948**	**10,526**	**4,832,116**	62%

	BAU	LEED	Net-Zero
City Water	12,693,418	9,520,063	4,832,116
Water Efficiency	0	3,173,354	3,173,354
Recycled Water	0	0	4,687,948
Total	12,693,418	12,693,418	12,693,418



Notes:
1. Daily Water Use values from Interface estimate
2. RW Use values from Puttman adjusted estimate
3. City Make-Up line is applicable if a recycled water system is used. It covers the shortfall of sewer treatment for additional irrigation in summer months

Building Water Use Estimates (Puttman)

Preliminary Adjusted Water Use Estimate

Building	Description	Units	Total Occupants	Toilet/Urinal: Toilet uses/day	flush rate (GPF)	Urinal Uses	Flush Rate (gpf)	Water use per day (gal)	Shower: Shower uses/day	Flow rate (GPM)	Duration (minutes)	Water use per day (gal)
Family	Typical Housing Unit	148	444	10	1.28			5,683	1	1.3	10	5,772
Childcare		1.0	170	3	1.28			653	0			0
			614					6,336				5,772

Building	Kitchen Sink: Sink uses/day	Flow rate (GPM)	Duration (minutes)	Water use per day (gal)	Lavatory: Lav uses/day	Flow rate (GPM)	Duration (minutes)	Water use per day (gal)	Laundry: loads/occupant /week	water/load (gal)	Ave. water use per day (gal)	Total: Ave. water use per day (gal/day)	Total GPD / Person	NP Total Ave Water use / day	NP GPD / Person
Family	3	1.5	1	1,998	3	1	1	1,332	1	10	634	15,419	34.7	5,683	12.8
Childcare	1	1.5	1	255	3	1	1	510	0.1	10	24	1,442	8.5	653	3.8
				2,253				1,842			659	16,862	27.5	6,336	10.3

Non-Potable water demand per day (gal/day) 6,336
Non-Potable water demand per month (gal/month) 190,080

Potable water demand per day (gal/day) 10,526
Potable water demand per month (gal/month) 315,767

Notes:
1. Interface value for total water use utilized in calculations. Average GPD matched assumption from other engineer and metered use from existing buildings
2. Puttman adjusted value for toilet flushing utilized in calculations.
3. Assumed 3 occupants per unit.
4. Childcare facility serves 140 children with a staff of 30.

Background Information (Interface/LEED, UCSC, and West Yost)

Preliminary Water Use Estimate (From Interface 12/4/17)

Building	Description	Units	Total Occupants	Toilet/Urinal: Toilet uses/day	flush rate (GPF)	Urinal Uses	Flush Rate (gpf)	Water use per day (gal)	Shower: Shower uses/day	Flow rate (GPM)	Duration (minutes)	Water use per day (gal)
Family	Typical Housing Unit	148	444	5	1.28			2,842	1	1.5	10	6,660
Childcare	TBD											
			444					2,842				6,660

Building	Kitchen Sink: Sink uses/day	Flow rate (GPM)	Duration (minutes)	Water use per day (gal)	Lavatory: Lav uses/day	Flow rate (GPM)	Duration (minutes)	Water use per day (gal)	Laundry: loads/occupant /week	water/load (gal)	Ave. water use per day (gal)	Total: Ave. water use per day (gal/day)	Ave. water use per day (CHECK) (gal/day)	Total GPD / Person	NP Total Ave Water use / day	NP GPD / Person
Family	4	1.5	1	2,664	5	1	1	2,220	1	13	825	15,210	15,210	34.3	2,842	6.4
Childcare																
				2,664				2,220			825	15,210	15,210	34.3	2,842	6.4

Non-Potable water demand per day (gal/day) 2,842
Non-Potable water demand per month (gal/month) 85,248

Potable water demand per day (gal/day) 12,369
Potable water demand per month (gal/month) 371,057

Existing Campus Housing 2015-16 Water Use (from UCSC)

Area	# of Units	Annual Use (gal)	Annual Gal per Bed	GPD per Unit
Family Student Housing	196	7,197,915	36,724	102.8

West Yost Assumptions

Building Type	# of Units	Annual Use (gal)	Annual Gal per Bed	GPD per Unit
Family Student Housing	125	5,155,625	41,245	113.0

Notes:
1. For typical apartments, # of occupied days calculated per Building Occupancy Schedule.
2. West Yost GPD value based on 365 days

Irrigation Estimates (from Walker Macy)

Irrigation Use from Walker Macy (12/15/17)

Month	Gallons	Days	GPD
Jan	32,159	31	1,037
Feb	43,570	28	1,556
Mar	80,396	31	2,593
Apr	323,659	30	10,789
May	482,377	31	15,561
Jun	529,058	30	17,635
Jul	559,993	31	18,064
Aug	482,377	31	15,561
Sep	404,574	30	13,486
Oct	289,426	31	9,336
Nov	140,045	30	4,668
Dec	128,633	31	4,149
Total	3,496,267	365	9,579

Building Occupany Assumptions (from Capstone)

Occupied Days Estimate

Family Student Housing			
Month	**Days**	**Occupation**	**Occupied Days**
Jan	31	100%	31
Feb	28	100%	28
Mar	31	100%	31
Apr	30	100%	30
May	31	100%	31
Jun	30	100%	30
Jul	31	100%	31
Aug	31	100%	31
Sep	30	100%	30
Oct	31	100%	31
Nov	30	100%	30
Dec	31	75%	23
Total Occupied Days			**357**

Notes:

APPENDIX B

Water Use Efficiency at UC Santa Cruz

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CITY OF SANTA CRUZ

INFORMATION REPORT

COUNCIL MEETING
MAY 23, 2017

DATE: May 2, 2017

TO: City Manager

DEPARTMENT: Water

SUBJECT: Water Use Efficiency at the University of California

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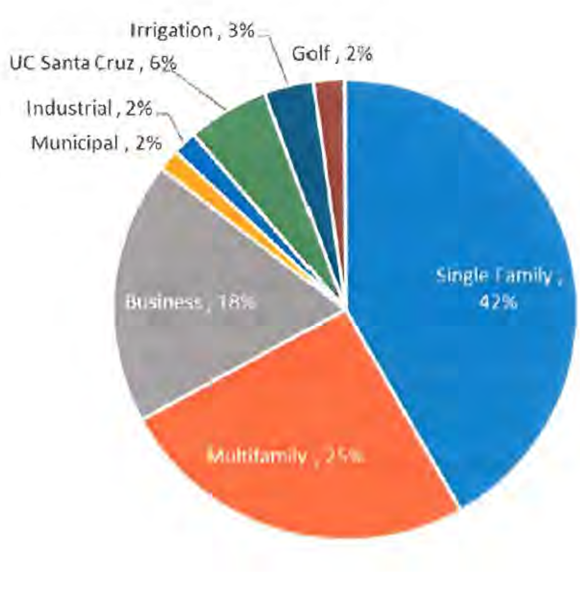
APPROVED: DATE: 5/8/17

On April 25, 2017, City Council addressed the subject of the next University Long Range Development Plan (LRDP). A few weeks before, Chancellor Blumenthal had announced that the planning process was just beginning and was inviting the community to provide its input. The next LRDP will serve as a blueprint for the future of UC Santa Cruz.

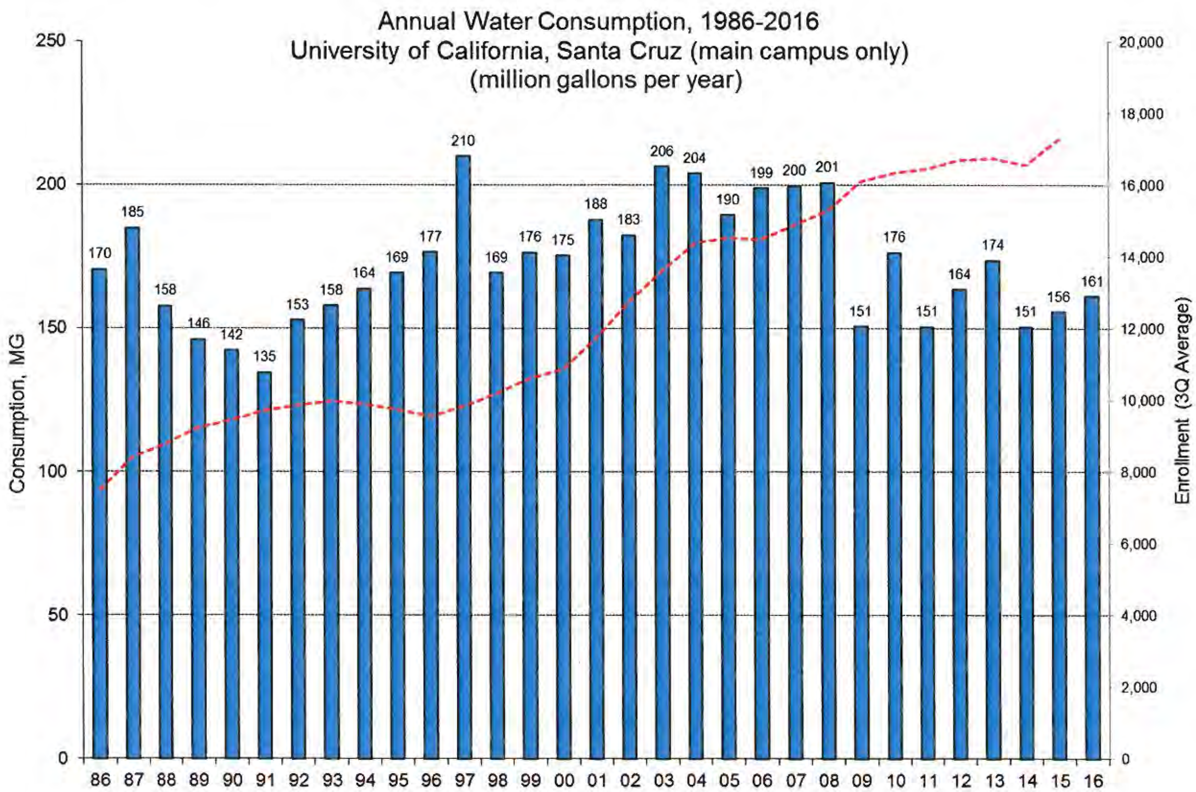
Water use has often been one of the concerns raised in connection with the University campus. Therefore, staff felt it would be useful to review the progress made through the collaborative efforts between University and City as this process gets under way. This information report provides background on four topics: 1) Annual University water consumption and trends, 2) University drought reduction performance, 3) University water action planning, and 4) Water Department projected water use.

Annual University Water Consumption and Trends

The chart below shows University water use in proportion to other City customer categories. It accounts for approximately six percent of the total annual consumption in any given year. This figure represents both the main campus as well as the Coastal Science Campus site on the west side of the City.



Annual water consumption on the main campus extending back to 1986 is illustrated in the chart below. Also shown is the change in student enrollment over this period. Note that despite a doubling in enrollment, annual water use remains relatively steady in the 30 years between 1986 and 2016. Stated another way, the amount of water use per enrolled student has declined during this period from about 60 gallons per student per day back in 1986 to about 25 gallons per student per day today.



One of the provisions of the 2008 Comprehensive Settlement Agreement was that the University would pay a fee equivalent to the City's system development charge for water used over 206 million gallons per year (mgy). This requirement to contribute funding has never been triggered since campus consumption has remained continuously below that threshold. A campus-wide efficiency survey, extensive plumbing fixtures retrofits, completion of all "high priority" conservation projects, and extensive student outreach and engagement have all helped in controlling campus water use over this time.

University Drought Reduction Performance

The campus has successfully met the City's mandatory water reduction goals because of close collaboration between the representative of all sectors across campus as well as with the Water Department. In both 2014 and 2015, a "water working group" led by the campus planning and sustainability offices established monthly budgets and directed efforts to reduce water use by 20 percent or about 20 million gallons during the peak dry season. Key to the success of this effort was an investment in new cellular-based meter reading technology that allowed individual building or facility managers to view their consumption on an hourly basis and quickly detect leaks. This technology will continue to help the University manage the campus' water use well into the future. A water conservation student intern team also helped communicate the conservation message to students and staff and helped identify and report leaks. For its efforts, the Santa Cruz campus established itself as a leader in water conservation and water efficiency among the University of California and other college campuses around the state.

University Water Action Planning

Consistent with state law that set a goal to reduce per capita water use by 20 percent in 2020, the UC Board of Regents in 2011 set a similar policy directing each campus to strive to reduce potable water consumption adjusted for campus population growth by 20 percent in 2020. To this end, the University in 2013 prepared a Water Action Plan that recognizes the limited nature of water resources in our region and the campus' role as a responsible steward in the community. The plan uses a "weighted campus user" baseline that normalizes for differences in water use between the number of on- and off-campus students, and full time vs part time students, faculty, and staff.

In 2016, the UC Office of the President adopted a more ambitious goal mirroring a 2015 Executive Order covering federal facilities. It calls for campuses to demonstrate leadership in the area of sustainable water systems by reducing potable water use 35 percent by 2025, as compared to a 2005 - 2008 baseline period, using the same weighted campus user approach. Some of the actions called out in the policy include:

- Converting potable water used for irrigation to recycled water,
- Implementing efficient irrigationsystems ,
- Drought tolerant plant selections,
- Phasing out unused turf, and
- Replacing single pass cooling systems or constant flow laboratory equipment

The campus is currently in the process of preparing this updated Water Action Plan that will address how it intends to meet this goal, and the actions included in that plan will extend through at least part of the time frame for the next LRDP.

Santa Cruz Water System 2015 – 2035 Projected Water Use

One of the first very requests made by the Water Supply Advisory Committee (WSAC) in 2014 was for the Water Department to update the system's demand forecast to reflect current information on water usage and to account for effects of conservation, water rates, and other factors expected to impact the future demand for water. Accordingly, the Water Department contracted with M.Cubed to develop two products: 1) an interim forecast to assist the early stages of the WSAC process, and 2) a separate, newly developed econometric demand forecast for the service area extending to the year 2035.

At the time of the University's last LRDP, its projected demand was estimated to be 349 million gallons per year (mgy). The 349 mgy figure was based in part on the 2005 LRDP, along with the Coastal Science Campus and Delaware Street facilities.

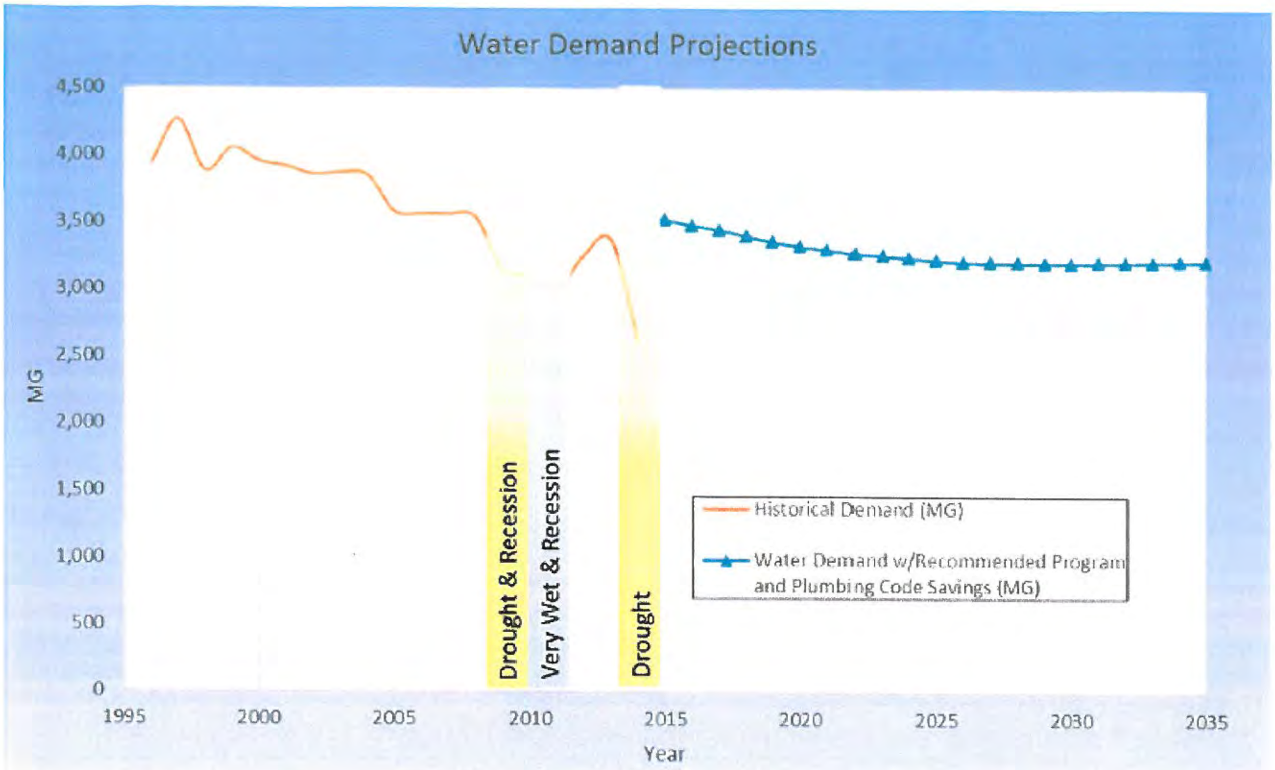
In developing the new long term demand forecast for the water system, an independent estimate of UCSC future demand was not made. Rather, after consulting with University staff, a decision was made to extend the University's previous forecast of 349 mgy in 2030 further out into the future to reflect a lower, more realistic rate of growth. Two endpoints were considered: a higher forecast ending with the full 349 mgy build out demand being achieved by 2035 and a lower forecast with the 349 mgy being achieved by 2050. The University demand forecast that was ultimately used for the econometric demand forecast, and later incorporated and adopted as part of the City's 2015 Urban Water Management Plan (UWMP), represents the mid-point between these two bounds.

As seen in the table below taken from the 2015 UWMP, and accompanying chart, the Water Department is planning for a future in which the University water use is projected to reach 308 mgy in 2035. Even still, the overall trend in system-wide water use according to this forecast is one in which total water use is expected to decline between 2020 and 2025 and then stabilize at a level of about 3.2 billion gallons per year.

Table 4-3. Demands for Potable Water - Projected

Use Type	Additional Description	Projected Water Use (mgy)				
		2020	2025	2030	2035	2040-opt
Single Family	Individually metered dwellings	1,277	1,223	1,191	1,170	n/a
Multi-Family	2 or more dwelling units	772	714	690	678	n/a
Commercial		574	541	525	519	n/a
Industrial		56	59	60	61	n/a
Institutional/ Governmental	Municipal (city) accounts	46	42	40	40	n/a
Landscape	Dedicated Irrigation	112	119	134	144	n/a
Landscape	Golf Irrigation	58	52	47	47	n/a
Other	UC Santa Cruz	196	234	271	308	n/a
Water Losses		236	241	247	253	n/a
	TOTAL	3,327	3,225	3,205	3,220	n/a
NOTES: David Mitchell, M Cubed, October 2015, and by Maddaus Water Management, February 2016						

While the next LRDP will raise legitimate concerns about the role the University plays in the community and how its plans for growth in enrollment may impact the community, it is clear that the University has a successful track record when it comes to keeping its share of the City's overall water use in check. One reason for the University's success is that many of the people that wrestle with this vital subject on a daily basis are also City residents or live within the water service area; they care about the surrounding community and share in its values for environmental stewardship and protection of our natural resources.



Staff will continue to work collaboratively with the University, in the spirit of the comprehensive settlement agreement, as the next LRPD process unfolds.

Submitted by:

Rosemary Menard

Rosemary Menard
Water Director

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