APPENDIX A
AIR QUALITY AND GHG REPORT FOR THE SIO MARINE CONSERVATION FACILITY
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# LIST OF ATTACHMENTS

ATTACHMENT A CALEEMOD RESULTS
1.0 INTRODUCTION

1.1 Introduction

The University of California, San Diego (UC San Diego) has proposed to renovate Building D as well as construct additions to the existing concrete slab foundation and basement level of Building A, two former National Oceanic and Atmospheric Administration (NOAA) Southwest Fisheries Science Center (SWFSC) buildings located on a bluff top in the northwestern most corner of the Scripps Institution of Oceanography (SIO) campus. The proposed SIO Marine Conservation Facility would repurpose existing space to support consolidation and expansion of teaching and research for members of the Center for Marine Biodiversity and Conservation (CMBC). The project would also provide an attractive space for UC San Diego sponsored events as well as other public and private events, accommodating up to a maximum of 150 individuals per event. The project would achieve Leadership in Energy Efficient Design (LEED) Silver rating by the U.S. Green Building Council (USGBC). This report has been prepared to analyze the potential air quality impacts resulting from construction and operation of the proposed project.

1.2 Purpose

The purpose of this Air Quality Report is to provide adequate information to make appropriate planning decisions and to make determinations regarding compliance with applicable regulations. This report evaluates construction-only and cumulative air quality impacts that may result from the proposed project. This report was prepared in accordance with the University of California California Environmental Quality Act (CEQA) Handbook that is used to review discretionary projects and environmental documents pursuant to CEQA.

1.3 Project Description

The proposed project would fully renovate the existing four-story, 26,967-gross square foot (GSF) Building D to provide laboratories, offices, and classrooms for the CMBC at the SIO campus. Under the proposed project the existing basement level of Building A would continue to serve as mechanical and electrical rooms. However, two additional stories, totaling approximately 15,147 GSF, would be constructed on the existing concrete slab foundation. Of that a 4,892-GSF second floor addition would include a 100-seat lecture room/event space, 30-seat conference room, visualization center for public outreach, and a catering kitchen – all at ground level. A 1,408-GSF café with an associated outdoor terrace and an approximately 47-foot and 5-inch shade trellis is proposed above the lecture room on the third level. Seating for the café would be provided for approximately 80 people; most of the seating would be outdoor at the terrace level.

Additional improvements to the project site would include the provision of 24 covered parking spaces for faculty, staff, and visitors, and a landscaped 7,000-SF terraced open space over the parking area, accessible from both Building A and Building D. The occupants of the Marine Conservation Facility would comprise 6 existing faculty, 6 staff, 37 graduate students, and 6 postdoctoral scholars, who would all relocated from other building on the SIO campus. The
project could accommodate up to 6 additional individuals in the future, for a total of 60 occupants. The café in Building A would have the capacity to seat approximately 80 individuals. The café would serve faculty, staff, students, and visitors at the SIO campus. The project would also convert the existing public overlook parking area to a coastal overlook and reintroduce coastal chaparral vegetation to the bluff edge, as well as provide seating and educational features.

Heavy equipment that would be used on-site for some or all of the grading and site preparation phase includes standard grading equipment such as dozers, graders, scrapers, tractors, loaders, backhoes, and a water truck. Demolition could involve equipment including dozers, concrete saws, tractors, loaders, backhoes, and other general industrial equipment. Building construction may involve use of cement mixers, cranes, forklifts, tractors, loaders, backhoes, and a water truck. Paving would involve use of cement mixers, rollers, and pavers. Architectural coating would use air compressors. Site preparation, grading, and construction are anticipated to begin in October 2017 and be completed for occupancy by November 2018.
2.0 ENVIRONMENTAL SETTINGS

2.1 Existing Setting

The project site is in the northwestern most corner of the West Neighborhood of the SIO campus, immediately west of La Jolla Shores Drive, east of the coastal bluffs and Pacific Ocean, north of Biological Grade Road, and south of a single-family residential neighborhood. The project is located on an approximately 3.22-acre site adjacent to an approximately 218-foot high coastal bluff, with the Building D set back approximately 85 feet from the bluff edge, and other paved areas, including the concrete foundation slab of Building A, located approximately 15 feet from the bluff edge. The project site currently includes the existing Building D, the basement and concrete slab of Building A, surface parking and associated driveways, a service yard with loading dock, and a coastal overlook. A coastal trail, with five associated parking spaces, runs adjacent to the project site to the southwest. Private, single-family residences are located north along La Jolla Shores Lane, and facilities associated with the SIO are located to the east and south along La Jolla Shores Drive. The project site is located on a relatively flat area, however the topography quickly slopes up toward the single-family residence and roads to the north and east, and slopes down sharply toward the ocean to the west.

2.2 Climate and Meteorology

The project site is located in the San Diego Air Basin (SDAB) which is regulated by the San Diego Air Pollution Control District (APC). The climate in the proposed project area is classified as a Mediterranean climate, with warm, dry summers and mild, wet winters. Average annual precipitation is 10.18 inches. Most precipitation occurs between the months of October and April. The normal high temperature in January is 64.7 degrees Fahrenheit (°F) with a normal low of 48°F. In July, the normal high temperature is 74.8°F and the normal low is 64.4°F.

One of the main determinants of the climatology is a persistent high-pressure area (the Pacific High) in the eastern Pacific Ocean. In the summer, this pressure center is located well to the north, causing storm tracks to be directed north of San Diego. When the Pacific High moves southward during the winter, this pattern changes, and low-pressure storms are brought into the region, causing widespread precipitation. The semi-permanent high pressure cell can also create temperature inversions, where a warmer mass of air sits above a cooler mass of air, which can result in decreased atmospheric dispersion often trapping smog close to the ground, and reducing the local air quality. The types of inversions include subsidence and radiation. A subsidence inversion generally occurs during warmer months as descending air associated with the high pressure cell meets cool marine air. The radiation inversion occurs on cool winter nights when air close to the ground cools by heat radiation while the air above the ground retains its warmer temperature (County of San Diego 2007).

2.3 Existing Air Quality in the Project Area

Air quality laws and regulations have established two wide-ranging categories of air pollutants that include "criteria air pollutants" and "toxic air contaminants". Criteria air pollutants are particle pollution, which are often referred to as particulate matter, carbon monoxide, sulfur oxides, nitrogen oxides, lead and ground-level ozone. This set of common pollutants are regulated by
both federal and state governments standards that are based on ambient air quality criteria in regards to both health and environmental effects. Toxic air contaminants (TACs) are substances in which there are no ambient air quality standards. However, TACs are known to cause adverse health effects, including the risk of cancer upon exposure, or acute and/or chronic non-cancer health effects. Some examples of TACs include asbestos, certain metals, and certain aromatic and chlorinated hydrocarbons. TACs are generated by a number of sources including both stationary sources such as gas stations and laboratories; and area sources such as landfills.

### Table 2-1. California and National Ambient Air Quality Standards

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Time</th>
<th>California Standards</th>
<th>Federal Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Concentration</td>
<td>Method</td>
</tr>
<tr>
<td>Ozone (O₃)</td>
<td>1-Hour</td>
<td>0.09 ppm (180 µg/m³)</td>
<td>Ultraviolet Photometry</td>
</tr>
<tr>
<td></td>
<td>8-Hour</td>
<td>0.070 ppm (137 µg/m³)</td>
<td>0.070 ppm (137 µg/m³)</td>
</tr>
<tr>
<td>Particulate Matter with an aerodynamic diameter of 10 micros or less (PM₁₀)</td>
<td>24-Hour</td>
<td>50 µg/m³</td>
<td>150 µg/m³</td>
</tr>
<tr>
<td>Particulate Matter with an aerodynamic diameter of 2.5 microns or less (PM₂.₅)</td>
<td>24-Hour</td>
<td>No Separate State Standard</td>
<td>35 µg/m³</td>
</tr>
<tr>
<td></td>
<td>Annual Arithmetic Mean</td>
<td>20 µg/m³</td>
<td>Gravimetric or Beta Attenuation</td>
</tr>
<tr>
<td>Carbon Monoxide (CO)</td>
<td>8-Hour</td>
<td>9.0 ppm (10 mg/m³)</td>
<td>Non-Dispersive Infrared Photometry (NDIR)</td>
</tr>
<tr>
<td></td>
<td>1-Hour</td>
<td>20 ppm (23 mg/m³)</td>
<td>Non-Dispersive Infrared Photometry (NDIR)</td>
</tr>
<tr>
<td></td>
<td>8-Hour (Lake Tahoe)</td>
<td>6 ppm (7 mg/m³)</td>
<td>Non-Dispersive Infrared Photometry (NDIR)</td>
</tr>
<tr>
<td>Nitrogen Dioxide (NO₂)</td>
<td>Annual Arithmetic Mean</td>
<td>0.030 ppm (57 µg/m³)</td>
<td>Gas Phase Chemiluminescence</td>
</tr>
</tbody>
</table>
### Table 2-1.
California and National Ambient Air Quality Standards (Cont.)

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Time</th>
<th>California Standards</th>
<th>Federal Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Concentration Method</td>
<td>Primary Secondary Method</td>
</tr>
<tr>
<td>Nitrogen Dioxide (NO₂)</td>
<td>1-Hour</td>
<td>Gas Phase Chemiluminescence</td>
<td>100 ppb (188 µg/m³)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.18 ppm (339 µg/m³)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.04 ppm (105 µg/m³)</td>
<td>0.14 ppm (for certain areas)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5 ppm (1300 µg/m³)</td>
<td>75 ppb (196 µg/m³)** 99th percentile of 1 hour daily concentrations, averaged over 3 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.25 ppm (665 µg/m³)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Annual Arithmetic Mean</td>
<td>0.30 ppm (for certain areas)</td>
</tr>
<tr>
<td></td>
<td>24-Hour</td>
<td>-</td>
<td>75 ppb (196 µg/m³)** 99th percentile of 1 hour daily concentrations, averaged over 3 years</td>
</tr>
<tr>
<td></td>
<td>3-Hour</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>1-Hour</td>
<td>Ultraviolet Fluorescence</td>
<td>-</td>
</tr>
<tr>
<td>Sulfur Dioxide (SO₂)</td>
<td>30-Day Average</td>
<td>1.5 µg/m³</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Calendar Quarter</td>
<td>-</td>
<td>1.5 µg/m³ (for certain areas)</td>
</tr>
<tr>
<td></td>
<td>Rolling 3-Month Average</td>
<td>-</td>
<td>0.15 µg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Atomic Absorption</td>
<td>-</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>30-Day Average</td>
<td>1.5 µg/m³</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Calendar Quarter</td>
<td>-</td>
<td>1.5 µg/m³ (for certain areas)</td>
</tr>
<tr>
<td></td>
<td>Rolling 3-Month Average</td>
<td>-</td>
<td>0.15 µg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Atomic Absorption</td>
<td>-</td>
</tr>
<tr>
<td>Visibility Reducing</td>
<td>8-Hour</td>
<td>Extinction coefficient of 0.23 per kilometer – visibility of ten miles or more (0.07 – 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.</td>
<td>No National Standards</td>
</tr>
<tr>
<td>Particles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfates</td>
<td>24-Hour</td>
<td>25 µg/m³</td>
<td>No National Standards</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>1-Hour</td>
<td>0.03 ppm (42 µg/m³)</td>
<td>No National Standards</td>
</tr>
<tr>
<td>Vinyl Chloride</td>
<td>24-Hour</td>
<td>0.01 ppm (26 µg/m³)</td>
<td>No National Standards</td>
</tr>
</tbody>
</table>

Source: California Air Resources Board. Available at: www.arb.ca.gov [Accessed 5 May 2016].
2.4 Background Air Quality

The APCD operates a network of ambient air monitoring stations throughout San Diego County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest ambient monitoring stations to the project location are the Del Mar – Winston School monitoring station which is located approximately 5.6 miles to the north of the campus in the Del Mar area and measures O₃, the Beardsley Street monitoring station which is located approximately 13.2 miles to the south of the project site and measures CO and SO₂, and the Kearny Villa Road monitoring station which is located approximately 7.6 miles to the east of the project site and measures NO₂, PM₂.₅, PM₁₀ and O₃.

The SDAB is currently designated nonattainment for O₃, both 1-hour and 8-hour, and particulate matter, PM₁₀ and PM₂.₅ under the California Ambient Air Quality Standards (CAAQS). It is designated attainment for CO, NO₂, SO₂, lead, and sulfates. Table 2 summarizes San Diego County’s federal and state attainment designations for each of the criteria pollutants.

Table 2-2.
San Diego County Attainment Status

<table>
<thead>
<tr>
<th>Criteria Pollutant</th>
<th>Federal Designation</th>
<th>State Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone (O₃) (8-Hour)</td>
<td>Nonattainment</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>Ozone (O₃) (1-Hour)</td>
<td>Attainment *</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>Respirable Particulate Matter (PM₁₀)</td>
<td>Unclassifiable **</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>Fine Particulate Matter (PM₂.₅)</td>
<td>Attainment</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>Nitrogen Dioxide (NO₂)</td>
<td>Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>Sulfur Dioxide (SO₂)</td>
<td>Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>Lead</td>
<td>Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>Sulfates</td>
<td>No Federal Standard</td>
<td>Attainment</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>No Federal Standard</td>
<td>Unclassified</td>
</tr>
<tr>
<td>Visibility Reducing Particles</td>
<td>No Federal Standard</td>
<td>Unclassified</td>
</tr>
</tbody>
</table>

* The federal 1-hour standard of 12 ppb was in effect from 1979 through June 15, 2005. The revoked standard is referenced here because it was employed for such a long period and because this benchmark is addressed in State Implementation Plans.
** At the time of designation, if the available data does not support a designation of attainment or nonattainment, the area is designated as unclassifiable.
Source: SDAPCD 2016.
3.0 REGULATORY FRAMEWORK

Federal, state, and local authorities have adopted rules and regulations requiring evaluation of impacts a project may have on air quality and appropriate mitigation for air pollutant emissions. Air quality is determined by measured concentrations in ambient air of specific pollutants identified by the U.S. Environmental Protection Agency (USEPA) that impact public health and welfare.

The USEPA is responsible for enforcing the Federal Clean Air Act (CAA) of 1970, and its Amendments of 1977 and 1990. The CAA requires the USEPA to establish the NAAQS, which establish concentrations of “criteria pollutants” in the ambient air which represent the maximum levels of background pollution considered to protect the public health and welfare with an adequate margin of safety. The CAA also specifies future dates for achieving compliance with the NAAQS. Primary and secondary NAAQS have been established for O₃, NO₂, CO, SO₂, PM₁₀, PM₂.₅, and Pb. The NAAQS are shown, along with the CAAQS, in Table 2-1.

The 1990 amendments to the CAA identify specific emission reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or to meet interim milestones.

In July 1997, the USEPA published additional standards for both particulate matter and O₃. In 2008 a revised O₃ standard of 0.075 parts per million (ppm) was set for the 8-hour standard. In 2015, both O₃ standards were revised to 0.070 ppm. The USEPA sought to refine the particulate standard by including a new standard for PM₂.₅. The revised particulate standard added a new PM₂.₅ 24-hour standard of 35 micrograms per cubic meter (µg/m³). In addition to the new PM₂.₅ standards, the USEPA decided to retain the existing PM₁₀ 24-hour standard of 150 µg/m³.

The CAA also mandates that each state submit and implement a State Implementation Plan (SIP) for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met. A SIP is a compilation of goals, strategies, schedules and enforcement actions that will lead the state (including the SDAB) into compliance with all federal air quality standards. Every change in a compliance schedule or plan must be incorporated into the SIP.

The CAA allows states to adopt ambient air quality standards and other regulations provided they are at least as stringent as federal standards. The California Air Resources Board (CARB) has established the more stringent CAAQS for the six criteria pollutants through the California Clean Air Act of 1988, and also has established CAAQS for additional pollutants, including sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles. Areas that do not meet the NAAQS or the CAAQS for a particular pollutant are considered to be “nonattainment areas” for that pollutant. The CARB is the state regulatory agency with authority to enforce regulations to both achieve and maintain the NAAQS and CAAQS. The CARB is responsible for the development, adoption, and enforcement of the state’s motor vehicle emissions program, as well as the adoption of the CAAQS. The CARB also reviews operations and programs of the local air districts, and requires each air district with jurisdiction over a nonattainment area to develop its own strategy for achieving the NAAQS and CAAQS. The local air district has the
primary responsibility for the development and implementation of rules and regulations designed to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations. The San Diego APCD (SDAPCD) is the local agency responsible for the administration and enforcement of air quality regulations for San Diego County, which has the same boundaries as the SDAB.

The SDAPCD, with input from the San Diego Association of Governments (SANDAG) is responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The San Diego County Regional Air Quality Strategy (RAQS) was initially adopted in 1991, and is updated on a triennial basis. The RAQS was updated in 1995, 1998, 2001, 2004, and most recently in 2009, with the 2016 revision coming out soon. The RAQS outlines SDAPCD’s plans and control measures designed to attain the state air quality standards for O₃. The SDAPCD has also developed the air basin’s input to the SIP, which is required under the CAA for areas that are out of attainment of air quality standards. The SIP includes the SDAPCD’s plans and control measures for attaining the O₃ NAAQS. The SIP is also updated on a triennial basis. The latest SIP update, which included an 8-hour O₃ attainment plan, was submitted by the CARB to the USEPA in 2012, and an updated 2016 State SIP Strategy is proposed. The attainment schedule in the 2012 SIP update called for the SDAB to prepare baseline emission inventories for all areas exceeding the NAAQS within two years of designation.

The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in the County, to project future emissions and then determine from that the strategies necessary for the reduction of emissions through regulatory controls. The CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by the 18 cities within the San Diego region and by the County as part of the development of the County’s General Plan. As such, projects that propose development that is consistent with the growth anticipated by the general plans and SANDAG’s growth forecasts would be consistent with the RAQS and the SIP. In the event that a project would propose development which is less dense than anticipated within the general plan, the project would likewise be consistent with the RAQS. If a project proposes development that is greater than that anticipated in the general plan and SANDAG’s growth projections, the project might be in conflict with the RAQS and SIP, and might have a significant impact on air quality.

The SIP relies on the same information from SANDAG to develop emission inventories and emission reduction strategies that are included in the attainment demonstration for the air basin. The SIP also includes rules and regulations that have been adopted by the SDAPCD to control emissions from stationary sources. These SIP-approved rules may be used as a guideline to determine whether a project’s emissions would have the potential to conflict with the SIP and thereby hinder attainment of the NAAQS for O₃. The California Clean Air Act requires areas designated as nonattainment of state ambient air quality standards for O₃, CO, SO₂ and NOₓ to prepare and implement plans to attain the standards. There are currently no requirements to prepare an implementation plan under California state rules.
4.0 THRESHOLDS OF SIGNIFICANCE

Significance criteria used to evaluate potential air quality impacts associated with the proposed project are established in the UC San Diego 2004 Long Range Development Plan (LRDP) EIR and are based on the University of California CEQA Handbook and Appendix G of the CEQA Guidelines. A project would have a significant environmental impact if it would:

1. Conflict or obstruct the implementation of the applicable air quality plan;
2. Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation;
3. Result in a cumulatively considerable net increase to any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard. This includes releasing emissions which exceed quantitative standards for ozone precursors;
4. Create objectionable odors affecting a substantial number of people.

To determine whether a project would (a) result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation; or (b) result in a cumulatively considerable net increase of PM$_{10}$, PM$_{2.5}$, or exceed quantitative thresholds for O$_3$ precursors, NO$_x$ and volatile organic compounds (VOCs), project emissions may be evaluated based on the quantitative emission thresholds established by the APCD. As part of its air quality permitting process, the APCD has established thresholds in Rule 20.2 and Rule 20.3 for the preparation of Air Quality Impact Assessments (AQIA). In the event emissions exceed the thresholds in Table 4-1, modeling would be required to demonstrate that the project’s total air quality impacts result in ground-level concentrations that are below the State and Federal Ambient Air Quality Standards, including appropriate background levels. For nonattainment pollutants O$_3$, including O$_3$ precursors NO$_x$ and VOCs, as well as PM$_{10}$ and PM$_{2.5}$, if emissions exceed the screening-level thresholds shown in Table 4-1, the project could have the potential to result in a cumulatively considerable net increase in these pollutants and thus could have a significant impact on the ambient air quality.

For CEQA purposes, these screening criteria can be used as numeric methods to demonstrate that a project’s total emissions would not result in a significant impact to air quality. The screening thresholds are included in Table 4-1.

**Table 4-1.**
Screening Level Thresholds for Air Quality Impact Analysis

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Pounds per Hour</th>
<th>Pounds per Day</th>
<th>Tons per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide (CO)</td>
<td>100</td>
<td>550</td>
<td>100</td>
</tr>
<tr>
<td>Nitrogen Oxides (NO$_x$)</td>
<td>25</td>
<td>250</td>
<td>40</td>
</tr>
<tr>
<td>Respirable Particulate Matter (PM$_{10}$)</td>
<td>-</td>
<td>100</td>
<td>15</td>
</tr>
<tr>
<td>Fine Particulate Matter (PM$_{2.5}$)</td>
<td>-</td>
<td>55</td>
<td>10</td>
</tr>
<tr>
<td>Oxides of Sulfur (SO$_x$)</td>
<td>25</td>
<td>250</td>
<td>40</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>-</td>
<td>3.2</td>
<td>0.6</td>
</tr>
<tr>
<td>Reactive Organic Gases (ROG)</td>
<td>-</td>
<td>137</td>
<td>15</td>
</tr>
</tbody>
</table>

Sources: City of San Diego 2011; SDAPCD Rule 1501, 20.2 (d)(2); USEPA 2005.
In addition to impacts from criteria pollutants, project impacts may include emissions of pollutants identified by the state and federal government as TACs.

The impacts associated with the proposed project were evaluated for significance based on the thresholds mentioned above. The California Emission Estimator Model (CalEEMod) version 2016.3.1 was used to estimate emissions generated from construction activities. CalEEMod uses basin-specific emission factors for San Diego County. To calculate on-road vehicle emissions during construction, CalEEMod uses Emissions Factor Model (EMFAC) 2014, which is the most recent motor vehicle emission factor model of ARB. Operational vehicle emission factors are based on EMFAC2014. To calculate the fugitive dust emissions from on-road vehicles driving over paved and unpaved roads during both construction and operation, CalEEMod uses emission factors from USEPA’s AP-42 for paved roads (January 2011 edition) and unpaved roads (November 2006 edition).
5.0 IMPACTS

5.1 Conformance to Federal and State Ambient Air Quality Standards

The proposed project would result in emissions of air pollutants from construction and operational activities. Construction emissions would be associated with fugitive dust, heavy construction equipment, construction workers commuting to and from the site, export hauling, and construction material deliveries to the site. The emissions associated with construction would be short-term and temporary in nature, occurring over an approximately 14-month period. Operational emissions would be associated with energy use of the project, and mobile emissions from faculty, staff, students, and visitors commuting to and from the site. All of the project air pollutant emissions are estimated to be below screening-level thresholds established by the APCD.

5.1.1 Construction Impacts

Emissions of pollutants such as fugitive dust and heavy equipment exhaust would be generated during construction and would be concentrated in the immediate vicinity of the project site. Construction duration is estimated to be approximately 14 months. Standard daytime operating hours would be used (7:00 AM – 7:00 PM) with equipment assumed to be operational for 5 to 8 hours per day. Heavy equipment that would be used on-site for some or all of the grading and excavation could include dozers, graders, scrapers, tractors, loaders, backhoes, and a water truck. Demolition could require use of dozers, tractors, loaders, backhoes, and other general industrial equipment. Paving could require use of cement mixers, pavers, rollers, tractors, loaders, and backhoes. For the purposes of evaluating potential impacts from construction, the maximum daily construction requirements were used for the model calculations, resulting in a worst-case evaluation of the potential maximum daily emissions. This included worker and vendor trips to the site.

Table 5-1 shows the estimated maximum daily emissions from construction activities over the approximate 14-month construction period. As summarized in Table 5-1, project criteria pollutant emissions are all below the daily thresholds of significance. Table 5-2 shows the estimated maximum annual emissions from construction activities. Refer to Appendix A for detailed emissions calculations.

The project would result in emission of diesel particulate matter from heavy construction equipment and vehicles accessing the site. However, due to the temporary nature of the project’s construction phase, and because the project would not generate a significant amount of diesel emissions from construction equipment or vehicles in any single location, the project would not result in a significant health risk. Project construction would also result in localized minor amounts of odor compounds associated with diesel heavy equipment exhaust. Because the construction equipment would be temporarily operating at various locations throughout the construction site, the proposed project is not expected to have a significant impact due to odors.
Table 5-1.
Total Mitigated Construction Emissions, lbs/day*
SIO Marine Conservation Facility

<table>
<thead>
<tr>
<th>Emission Source</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO2</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demolition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fugitive Dust</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Off-Road Emissions</td>
<td>0.4844</td>
<td>10.3677</td>
<td>7.9381</td>
<td>0.0120</td>
<td>0.4017</td>
<td>0.4017</td>
</tr>
<tr>
<td>Hauling</td>
<td>0.0118</td>
<td>0.3740</td>
<td>0.0800</td>
<td>0.0009</td>
<td>0.0208</td>
<td>0.0071</td>
</tr>
<tr>
<td>Vendor</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Worker</td>
<td>0.0531</td>
<td>0.0389</td>
<td>0.3860</td>
<td>0.0822</td>
<td>0.0828</td>
<td>0.0224</td>
</tr>
<tr>
<td>TOTAL</td>
<td>0.5492</td>
<td>10.7806</td>
<td>8.3984</td>
<td>0.0138</td>
<td>0.5536</td>
<td>0.4385</td>
</tr>
<tr>
<td>Site Preparation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fugitive Dust</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Off-Road Emissions</td>
<td>0.3079</td>
<td>8.6185</td>
<td>5.8579</td>
<td>0.0098</td>
<td>0.2405</td>
<td>0.2405</td>
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<td>Hauling</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Vendor</td>
<td>0</td>
<td>0</td>
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<td>0</td>
</tr>
<tr>
<td>Worker</td>
<td>0.0265</td>
<td>0.0195</td>
<td>0.1930</td>
<td>0.0005</td>
<td>0.0414</td>
<td>0.0112</td>
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<td>TOTAL</td>
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<td>6.0509</td>
<td>0.0102</td>
<td>0.2869</td>
<td>0.2522</td>
</tr>
<tr>
<td>Grading</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fugitive Dust</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Off-Road Emissions</td>
<td>0.4844</td>
<td>10.3677</td>
<td>7.9381</td>
<td>0.0120</td>
<td>0.4017</td>
<td>0.4017</td>
</tr>
<tr>
<td>Hauling</td>
<td>0.0118</td>
<td>0.3740</td>
<td>0.0800</td>
<td>0.0009</td>
<td>0.0208</td>
<td>0.0071</td>
</tr>
<tr>
<td>Vendor</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Worker</td>
<td>0.0531</td>
<td>0.0389</td>
<td>0.3860</td>
<td>0.0822</td>
<td>0.0828</td>
<td>0.0224</td>
</tr>
<tr>
<td>TOTAL</td>
<td>0.5374</td>
<td>10.4066</td>
<td>8.3241</td>
<td>0.0129</td>
<td>0.6434</td>
<td>0.5086</td>
</tr>
<tr>
<td>Building</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Off-Road Emissions</td>
<td>0.9408</td>
<td>21.4036</td>
<td>15.9248</td>
<td>0.0228</td>
<td>0.7710</td>
<td>0.7710</td>
</tr>
<tr>
<td>Hauling</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Vendor</td>
<td>0.0232</td>
<td>0.5472</td>
<td>0.1627</td>
<td>0.0012</td>
<td>0.0318</td>
<td>0.0125</td>
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<tr>
<td>Worker</td>
<td>0.0505</td>
<td>0.0367</td>
<td>0.3554</td>
<td>0.0010</td>
<td>0.0828</td>
<td>0.0224</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1.0145</td>
<td>21.9875</td>
<td>16.4363</td>
<td>0.0248</td>
<td>0.8856</td>
<td>0.8056</td>
</tr>
</tbody>
</table>
Table 5-1.
Total Mitigated Construction Emissions, lbs/day* (Cont.)

<table>
<thead>
<tr>
<th>Emission Source</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO₂</th>
<th>PM₁₀</th>
<th>PM₂.₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-Road Emissions</td>
<td>0.3954</td>
<td>8.3730</td>
<td>6.9028</td>
<td>0.0113</td>
<td>0.3043</td>
<td>0.3043</td>
</tr>
<tr>
<td>Paving</td>
<td>0.0131</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hauling</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Vendor</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Worker</td>
<td>0.0955</td>
<td>0.0701</td>
<td>0.6948</td>
<td>0.0016</td>
<td>0.1489</td>
<td>0.0402</td>
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<tr>
<td>TOTAL</td>
<td>0.5040</td>
<td>8.4431</td>
<td>7.5976</td>
<td>0.0129</td>
<td>0.4532</td>
<td>0.3445</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emission Source</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO₂</th>
<th>PM₁₀</th>
<th>PM₂.₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectural Coating</td>
<td>20.7501</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>0</td>
</tr>
<tr>
<td>Off-Road Emissions</td>
<td>0.1139</td>
<td>2.3524</td>
<td>1.8324</td>
<td>0.0030</td>
<td>0.0951</td>
<td>0.0951</td>
</tr>
<tr>
<td>Hauling</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Vendor</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Worker</td>
<td>0.0053</td>
<td>0.0039</td>
<td>0.0386</td>
<td>0</td>
<td>0.0022</td>
<td>0.0022</td>
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<tr>
<td>TOTAL</td>
<td>20.8693</td>
<td>2.3563</td>
<td>1.8710</td>
<td>0.0031</td>
<td>0.1034</td>
<td>0.0973</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emission Source</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO₂</th>
<th>PM₁₀</th>
<th>PM₂.₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRAND TOTAL</td>
<td>23.8088</td>
<td>62.6120</td>
<td>48.6783</td>
<td>0.0777</td>
<td>2.9261</td>
<td>2.4467</td>
</tr>
<tr>
<td>Screening Level Threshold (lbs/day)</td>
<td>137</td>
<td>250</td>
<td>550</td>
<td>250</td>
<td>100</td>
<td>55</td>
</tr>
<tr>
<td>Above Threshold?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes: * Daily emission rates were calculated using worst case scenario of each phase.
Source: See Attachment A for detailed CalEEMod reports.

Table 5-2.
Total Mitigated Construction Emissions (tons/year)
SIO Marine Conservation Facility

<table>
<thead>
<tr>
<th>Year</th>
<th>Emission Source</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO₂</th>
<th>PM₁₀</th>
<th>PM₂.₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>TOTAL</td>
<td>0.1999</td>
<td>0.9228</td>
<td>0.7064</td>
<td>0.0011</td>
<td>0.0413</td>
<td>0.0351</td>
</tr>
<tr>
<td>2018</td>
<td>TOTAL</td>
<td>0.0369</td>
<td>0.7955</td>
<td>0.5934</td>
<td>0.0009</td>
<td>0.0333</td>
<td>0.0293</td>
</tr>
<tr>
<td></td>
<td>GRAND TOTAL</td>
<td>0.2368</td>
<td>1.7183</td>
<td>1.2998</td>
<td>0.0020</td>
<td>0.0746</td>
<td>0.0644</td>
</tr>
<tr>
<td></td>
<td>Screening Level Threshold (tons/yr)</td>
<td>15</td>
<td>40</td>
<td>100</td>
<td>40</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Above Threshold?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: See Attachment A for detailed CalEEMod reports.

5.1.2 Operational Impacts

Operational impacts typically are associated criteria pollutant emissions from traffic and area sources such as landscaping and energy use. Table 5-3 shows the estimated maximum daily emissions and annual emissions from operational activities of the project. Refer to Attachment A
for detailed emissions calculations. As summarized in Table 5-3, project criteria pollutant emissions are all below the daily and annual thresholds of significance.

Table 5-3.  Operational Emissions  
SIO Marine Conservation Facility

<table>
<thead>
<tr>
<th>Emission Source</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SOx</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peak Daily Operational Emissions (lbs/day)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>1.4391</td>
<td>0.0001</td>
<td>0.0125</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
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<td>0.2856</td>
<td>0.0020</td>
<td>0.0258</td>
<td>0.0258</td>
</tr>
<tr>
<td>Mobile</td>
<td>0.5891</td>
<td>2.3466</td>
<td>6.5236</td>
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<td>0.9925</td>
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<td><strong>TOTAL</strong></td>
<td>2.0656</td>
<td>2.6867</td>
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</tr>
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<td>Screening Level Threshold (lbs/day)</td>
<td>137</td>
<td>250</td>
<td>550</td>
<td>250</td>
<td>100</td>
<td>55</td>
</tr>
<tr>
<td>Above Threshold?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emission Source</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SOx</th>
<th>PM10</th>
<th>PM2.5</th>
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</thead>
<tbody>
<tr>
<td><strong>Annual Operational Emissions (tons/year)</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
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<td>0.0047</td>
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<tr>
<td>Mobile</td>
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<td>0.2836</td>
<td>0.0022</td>
<td>0.0022</td>
<td>0.1058</td>
<td>0.0318</td>
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<tr>
<td><strong>TOTAL</strong></td>
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<td>0.8016</td>
<td>0.0026</td>
<td>0.1105</td>
<td>0.0365</td>
</tr>
<tr>
<td>Screening Level Threshold (lbs/day)</td>
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<td>40</td>
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<td>40</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Above Threshold?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes: * Maximum of winter and summer day mitigated emissions, from CalEEMod.  
Source: See Attachment A for detailed CalEEMod reports.

5.1.3 Impacts to Sensitive Receptors

Based on Appendix G of the CEQA Guidelines, an impact is considered significant if the implementation of the project:

- Exposes sensitive receptors to substantial pollutant concentrations;
- Increases the maximally exposed individual’s cancer risk by more than 10 in one million;
- Results in a ground-level concentration of non-carcinogenic TACs that would result in a hazard index greater than 1 for the maximally exposed individual.

The construction phase of the project would result in emission of diesel particulate matter from heavy construction equipment and vehicles accessing the site. However, due to the temporary nature of the project’s construction phase, and because the project would not generate a significant amount of diesel emissions from construction equipment or vehicles in any single location, the project would not result in a significant health risk.
6.0 SUMMARY AND CONCLUSIONS

The project’s potential effect on air quality was evaluated for both the construction and operation of the project. Construction emissions would include emissions associated with site grading, heavy construction equipment and construction worker commuting to and from the site. Emissions from construction would be short-term and temporary. Operational emissions would include emissions associated with vehicle trips to and from the project site, landscaping, and energy use. Although construction emissions would be below the significance thresholds, the 2004 LRDP EIR, as updated by the 2010 East Campus Bed Tower (ECBT) EIR, concluded that cumulative PM$_{10}$ impacts, including the proposed project, would be significant. To reduce cumulative air quality impacts caused by campus construction, 2004 LRDP EIR Mitigation Measures Air-CA, Air-CB and Air-CC would be incorporated into the proposed project to reduce the project’s contributions to cumulative construction-related PM emissions. Implementation of the following measures would minimize the project’s contribution to cumulative particulate emissions:

**Air-CA**

The following measures shall be implemented campus-wide to reduce PM$_{10}$ emissions from vehicles, as feasible, and on specific projects when applicable:

- **Compliance with the UC Policy for Green Building Design and Clean Energy Standards, which guides the design of green buildings and the use of clean energy.**
- **Reduce emissions related to motor vehicle trips through refinements to the Transportation System Management program or other methods to discourage automobile use and encourage use of alternative transportation.**
- **Expand pedestrian-enhancing infrastructure to encourage pedestrian activity and discourage vehicle use.**
- **Expand bicycle facilities to encourage bicycle use instead of driving.**
- **Expand transit-enhancing infrastructure to promote the use of public transportation such as buses, light rail, and other applicable methods.**
- **Expand facilities to accommodate alternative-fuel vehicles such as electric cars and compressed natural gas vehicles.**
- **Expand on-site housing and retail services to facilitate pedestrian activity and reduce need for off-site travel.**
Air-CB

Any development on the UCSD campus shall include in all construction contracts the measures specified below to reduce PM$_{10}$ and PM$_{2.5}$ air pollutant emissions:

- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, or other stabilization techniques.
- All land clearing and grading and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- Street sweeping shall be performed regularly on roads surrounding the construction site that carry construction traffic or collect construction related dust or dirt.
- Revegetate exposed earth surface following construction.
- Limit traffic speeds on unpaved roads to 15 miles per hour.
- To the extent that equipment is available and cost effective, the campus shall encourage contractors to use alternate fuels and retrofit existing engines in construction equipment.
- Minimize idling time to a maximum of 10 minutes when construction equipment is not in use.
- To the extent practicable, manage operation of heavy-duty equipment (e.g., restrict operations, operate only when necessary) to reduce emissions.

Air-CC

Campus construction contracts/specifications shall include language that requires medium and large sized construction fleets to comply with the requirements of the ARB proposed regulation for In-use Off-road Diesel Vehicles (Section 2449, Title 13, Article 4.8, California Code of Regulations, as modified).
7.0 REFERENCES

Air Pollution Control District of San Diego County (APCD). 2007. 8-Hour Ozone Attainment Plan. May.


County of San Diego, Department of Planning and Land Use, Department of Public Works, Land Use and Environment Group. 2007. County of San Diego Guidelines for Determining Significance and Report Content Requirements, Air Quality. March 19.


8.0 LIST OF PREPARERS

Laura Ingulsrud  
Environmental Analyst - Preparer  
Amec Foster Wheeler Environment & Infrastructure, Inc.

Stephen Ochs, PE  
Air Quality Specialist - Reviewer  
Amec Foster Wheeler Environment & Infrastructure, Inc.

Nick Meisinger  
Project Manager - Reviewer  
Amec Foster Wheeler Environment & Infrastructure, Inc.
ATTACHMENT A

CALEEMOD RESULTS
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1.0 Project Characteristics

1.1 Land Usage

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1.2 Other Project Characteristics

- **Urbanization**: Urban
- **Wind Speed (m/s)**: 2.6
- **Precipitation Freq (Days)**: 40
- **Climate Zone**: 13
- **Operational Year**: 2019
- **Utility Company**: San Diego Gas & Electric

1.3 User Entered Comments & Non-Default Data
Project Characteristics -

Land Use - Total new square footage of 6,300 SF (proposed Building A additions) + 7,000 SF (proposed open terrace area) = 13,300 SF. Restaurant use is included within "university" land use in CalEEMod. Would add 24 spaces and 4,357 sf of new pavement for extra parking spaces.

Construction Phase - Site preparation, grading, and construction are anticipated to begin in June 2017 and be completed by the beginning of the 2018 academic year in September 2018.

Grading - Cleared/grubbed area = 0.347 acres
Graded area = 0.457 acres

Demolition -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Construction Off-road Equipment Mitigation - Default fuel type
· Tier 2 engine type
· Default DPF level

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2.0 Emissions Summary
### 2.1 Overall Construction

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<th>Fugitive PM10</th>
<th>Exhaust PM10 Total</th>
<th>Fugitive PM2.5</th>
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<th>Bio- CO2</th>
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#### Mitigated Construction

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2.2 Overall Operational

Unmitigated Operational

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Quarter | Start Date | End Date | Maximum Unmitigated ROG + NOX (tons/quarter) | Maximum Mitigated ROG + NOX (tons/quarter) |
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### 2.2 Overall Operational

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| 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 | 0.00 |

### 3.0 Construction Detail

#### Construction Phase
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**Acres of Grading (Site Preparation Phase): 0.347**

**Acres of Grading (Grading Phase): 0.457**

**Acres of Paving: 0.100023**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 19,950; Non-Residential Outdoor: 6,650; Striped Parking Area: 261 (Architectural Coating – sqft)**

**OffRoad Equipment**
## Phase Name Summary

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<tr>
<th>Phase Name</th>
<th>Offroad Equipment Type</th>
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### 3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment
Use Soil Stabilizer
Replace Ground Cover
Water Exposed Area
Reduce Vehicle Speed on Unpaved Roads
Clean Paved Roads

### 3.2 Demolition - 2017

**Unmitigated Construction On-Site**

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### 3.3 Site Preparation - 2017

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### 3.3 Site Preparation - 2017

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### 3.4 Grading - 2017

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### 3.4 Grading - 2017

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**Mitigated Construction On-Site**

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### 3.4 Grading - 2017

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### 3.5 Building Construction - 2017

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### 3.5 Building Construction - 2017

#### Unmitigated Construction Off-Site

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#### Mitigated Construction On-Site

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**Date:** 3/21/2017 11:52 AM  
**SIO Marine Conservation Facility - San Diego Air Basin, Annual**
### 3.5 Building Construction - 2017

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### 3.5 Building Construction - 2018

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#### 3.6 Paving - 2017

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### 3.7 Architectural Coating - 2017

**Unmitigated Construction On-Site**

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<th>PM2.5 Total</th>
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<th>CH4</th>
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<th>CO2e</th>
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### 3.7 Architectural Coating - 2017

#### Unmitigated Construction Off-Site

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#### Mitigated Construction On-Site

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<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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3.7 Architectural Coating - 2017

Mitigated Construction Off-Site

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4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile
### 4.2 Trip Summary Information

<table>
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<tr>
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<th>Average Daily Trip Rate</th>
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<th>Mitigated</th>
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<td>Sunday</td>
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### 4.3 Trip Type Information

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<th>Trip Purpose %</th>
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<td>H-S or C-C</td>
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### 4.4 Fleet Mix

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<th>LDT2</th>
<th>MDV</th>
<th>LHD1</th>
<th>LHD2</th>
<th>MHD</th>
<th>HHD</th>
<th>OBUS</th>
<th>UBUS</th>
<th>MCY</th>
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<tr>
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<td>0.044135</td>
<td>0.186694</td>
<td>0.113515</td>
<td>0.018244</td>
<td>0.005600</td>
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<td>0.002088</td>
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### 5.0 Energy Detail
### 5.1 Mitigation Measures Energy

<table>
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<tr>
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<th>NOx</th>
<th>CO</th>
<th>SO2</th>
<th>Fugitive PM10</th>
<th>Exhaust PM10</th>
<th>PM10 Total</th>
<th>Fugitive PM2.5</th>
<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio- CO2</th>
<th>NBio- CO2</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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**Historical Energy Use:** N
### 5.2 Energy by Land Use - NaturalGas

#### Unmitigated

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<th>Exhaust PM10</th>
<th>PM10 Total</th>
<th>Fugitive PM2.5</th>
<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio- CO2</th>
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<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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<tr>
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#### Mitigated

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<th>Bio- CO2</th>
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### 5.3 Energy by Land Use - Electricity

#### Unmitigated

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<th>Total CO2 MT/yr</th>
<th>CH4 MT/yr</th>
<th>N2O MT/yr</th>
<th>CO2e MT/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking Lot</td>
<td>3834.16</td>
<td>1.2530</td>
<td>5.0000e-005</td>
<td>1.0000e-005</td>
<td>1.2574</td>
</tr>
<tr>
<td>University/College (4Yr)</td>
<td>121163</td>
<td>39.5971</td>
<td>1.5900e-003</td>
<td>3.3000e-004</td>
<td>39.7352</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40.8502</strong></td>
<td><strong>1.6400e-003</strong></td>
<td><strong>3.4000e-004</strong></td>
<td><strong>40.9927</strong></td>
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</tbody>
</table>

#### Mitigated

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Electricity Use kWh/yr</th>
<th>Total CO2 MT/yr</th>
<th>CH4 MT/yr</th>
<th>N2O MT/yr</th>
<th>CO2e MT/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking Lot</td>
<td>3834.16</td>
<td>1.2530</td>
<td>5.0000e-005</td>
<td>1.0000e-005</td>
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</tr>
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<td><strong>3.4000e-004</strong></td>
<td><strong>40.9927</strong></td>
<td></td>
</tr>
</tbody>
</table>

### 6.0 Area Detail

#### 6.1 Mitigation Measures Area
### 6.2 Area by SubCategory

#### Unmitigated

<table>
<thead>
<tr>
<th>SubCategory</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO2</th>
<th>Fugitive PM10</th>
<th>Exhaust PM10</th>
<th>PM10 Total</th>
<th>Fugitive PM2.5</th>
<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio- CO2</th>
<th>NBio- CO2</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectural Coating</td>
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</tr>
<tr>
<td>Consumer Products</td>
<td>0.0522</td>
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<td>0.0000</td>
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<tr>
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</tr>
</tbody>
</table>
### 6.2 Area by SubCategory

#### Mitigated

<table>
<thead>
<tr>
<th>SubCategory</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO2</th>
<th>Fugitive PM10</th>
<th>Exhaust PM10</th>
<th>PM10 Total</th>
<th>Fugitive PM2.5</th>
<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio- CO2</th>
<th>NBio- CO2</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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<tbody>
<tr>
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<tr>
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<td>2.0000e-004</td>
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### 7.0 Water Detail

#### 7.1 Mitigation Measures Water
<table>
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<tr>
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### 7.2 Water by Land Use

#### Unmitigated

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<tr>
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<th>Indoor/Outdoor Use</th>
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<th>CO2e</th>
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**Total**

| Total | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
### 7.2 Water by Land Use

#### Mitigated

<table>
<thead>
<tr>
<th>Indoor/Outdoor Use</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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</thead>
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### 8.0 Waste Detail

#### 8.1 Mitigation Measures Waste

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</thead>
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<td><strong>Unmitigated</strong></td>
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### 8.2 Waste by Land Use

#### Unmitigated

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<tr>
<th>Land Use</th>
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#### Mitigated

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Waste Disposed</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
</tr>
</thead>
<tbody>
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<td>0.0000</td>
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<td>0.0000</td>
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<tr>
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### 9.0 Operational Offroad

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<thead>
<tr>
<th>Equipment Type</th>
<th>Number</th>
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<th>Days/Year</th>
<th>Horse Power</th>
<th>Load Factor</th>
<th>Fuel Type</th>
</tr>
</thead>
</table>
### 10.0 Stationary Equipment

#### Fire Pumps and Emergency Generators

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Number</th>
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<th>Hours/Year</th>
<th>Horse Power</th>
<th>Load Factor</th>
<th>Fuel Type</th>
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</thead>
</table>

#### Boilers

<table>
<thead>
<tr>
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<th>Heat Input/Year</th>
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<th>Fuel Type</th>
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#### User Defined Equipment

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<tr>
<th>Equipment Type</th>
<th>Number</th>
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### 11.0 Vegetation
1.0 Project Characteristics

1.1 Land Usage

<table>
<thead>
<tr>
<th>Land Uses</th>
<th>Size</th>
<th>Metric</th>
<th>Lot Acreage</th>
<th>Floor Surface Area</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>University/College (4Yr)</td>
<td>0.00</td>
<td></td>
<td>0.00</td>
<td>13,300.00</td>
<td>0</td>
</tr>
<tr>
<td>Parking Lot</td>
<td>24.00</td>
<td>Space</td>
<td>0.10</td>
<td>4,357.00</td>
<td>0</td>
</tr>
</tbody>
</table>

1.2 Other Project Characteristics

- **Urbanization**: Urban
- **Wind Speed (m/s)**: 2.6
- **Precipitation Freq (Days)**: 40
- **Climate Zone**: 13
- **Operational Year**: 2019
- **Utility Company**: San Diego Gas & Electric

**CO2 Intensity (lb/MWhr)**: 720.49
**CH4 Intensity (lb/MWhr)**: 0.029
**N2O Intensity (lb/MWhr)**: 0.006

1.3 User Entered Comments

Only CalEEMod defaults were used.
Project Characteristics -

Land Use - Total new square footage of 6,300 SF (proposed Building A additions) + 7,000 SF (proposed open terrace area) = 13,300 SF. Restaurant use is included within “university” land use in CalEEMod. Would add 24 spaces and 4,357 sf of new pavement for extra parking spaces.

Construction Phase - Site preparation, grading, and construction are anticipated to begin in June 2017 and be completed by the beginning of the 2018 academic year in September 2018.

Grading -
- Cleared/grubbed area = 0.347 acres
- Graded area = 0.457 acres

Demolition -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Construction Off-road Equipment Mitigation -
- Default fuel type
- Tier 2 engine type
- Default DPF level

2.0 Peak Daily Emissions

Peak Daily Construction Emissions

Peak Daily Construction Emissions
## Peak Daily Operational Emissions

### Peak Daily Operational Emissions

<table>
<thead>
<tr>
<th>Year</th>
<th>Operational Activity</th>
<th>Unmitigated</th>
<th>Mitigated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ROG</td>
<td>NOX</td>
</tr>
<tr>
<td>2017</td>
<td>Demolition</td>
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<td>10.9107 W</td>
</tr>
<tr>
<td>2017</td>
<td>Site Preparation</td>
<td>0.8789 W</td>
<td>10.5342 W</td>
</tr>
<tr>
<td>2017</td>
<td>Grading</td>
<td>1.2630 W</td>
<td>10.5368 W</td>
</tr>
<tr>
<td>2017</td>
<td>Building Construction</td>
<td>1.3369 W</td>
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<td>2018</td>
<td>Building Construction</td>
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<tr>
<td>2017</td>
<td>Paving</td>
<td>1.1618 W</td>
<td>10.0455 W</td>
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<tr>
<td>2017</td>
<td>Architectural Coating</td>
<td>21.0877 W</td>
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<td>Peak Daily Total</td>
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### Air District Threshold Exceed Significance?
## 3.0 Annual GHG Emissions

### Annual GHG

<table>
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<th>Year</th>
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<th>Unmitigated CH4</th>
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<th>Mitigated CH4</th>
<th>Mitigated N2O</th>
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</table>
1.0 Project Characteristics

1.1 Land Usage

<table>
<thead>
<tr>
<th>Land Uses</th>
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<td>0</td>
</tr>
</tbody>
</table>

1.2 Other Project Characteristics

Urbanization: Urban  
Wind Speed (m/s): 2.6
Precipitation Freq (Days): 40

Climate Zone: 13  
Operational Year: 2019

Utility Company: San Diego Gas & Electric

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CH4 Intensity (lb/MWhr): 0.029  
N2O Intensity (lb/MWhr): 0.006

1.3 User Entered Comments & Non-Default Data
Project Characteristics -

Land Use - Total new square footage of 6,300 SF (proposed Building A additions) + 7,000 SF (proposed open terrace area) = 13,300 SF. Restaurant use is included within "university" land use in CalEEMod. Would add 24 spaces and 4,357 sf of new pavement for extra parking spaces.

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Graded area = 0.457 acres

Demolition -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Construction Off-road Equipment Mitigation - Default fuel type
Tier 2 engine type
Default DPF level

<table>
<thead>
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## 2.0 Emissions Summary

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# 2.1 Overall Construction (Maximum Daily Emission)

## Unmitigated Construction

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<th>Bio-CO2</th>
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## Mitigated Construction

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## Percent Reduction

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## 2.2 Overall Operational

### Unmitigated Operational

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3.0 Construction Detail

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<td>7/12/2017</td>
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Acres of Grading (Site Preparation Phase): 0.347

Acres of Grading (Grading Phase): 0.457

Acres of Paving: 0.100023

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 19,950; Non-Residential Outdoor: 6,650; Striped Parking Area: 261 (Architectural Coating – sqft)

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<th>Usage Hours</th>
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**Trips and VMT**

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<td>20.00</td>
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### 3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

### 3.2 Demolition - 2017

**Unmitigated Construction On-Site**

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### 3.2 Demolition - 2017

#### Unmitigated Construction Off-Site

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#### Mitigated Construction On-Site

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### 3.2 Demolition - 2017

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### 3.3 Site Preparation - 2017

**Unmitigated Construction On-Site**

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CalEEMod Version: CalEEMod.2016.3.1

SIO Marine Conservation Facility - San Diego Air Basin, Summer
### 3.3 Site Preparation - 2017

#### Unmitigated Construction Off-Site

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### 3.3 Site Preparation - 2017

#### 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 |
|------------|-----|-----|-----|-----|--------------|--------------|------------|---------------|--------------|------------|-----------|-----------|-----------|----------|-----|-----|------|
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| 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     | 0.0235 | 0.0173 | 0.1930 | 4.6000e-004 | 0.0411 | 3.0000e-004 | 0.0414 | 0.0109 | 2.8000e-004 | 0.0112 | 46.1556 | 46.1556 | 1.7100e-003 | 46.1984 |
| Total      | 0.0235 | 0.0173 | 0.1930 | 4.6000e-004 | 0.0411 | 3.0000e-004 | 0.0414 | 0.0109 | 2.8000e-004 | 0.0112 | 46.1556 | 46.1556 | 1.7100e-003 | 46.1984 |

### 3.4 Grading - 2017

#### 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 |
|----------------|---------|---------|-------|---------|--------------|--------------|------------|---------------|--------------|------------|-----------|-----------|-----------|----------|-----|-----|------|
| Fugitive Dust  | 0.7851  | 0.0000  | 0.7851 | 0.4173  | 0.0000 | 0.4173 | 0.0000 | 0.4173 | 0.0000 | 0.4173 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road       | 1.2100  | 10.4978 | 7.9182 | 0.0120  | 0.7318 | 0.7318 | 0.6978 | 0.6978 | 1.179.307 | 1.179.307 | 0.2319 | 1.185.104 | 1,185.104 | 7 | 7 |
| Total          | 1.2100  | 10.4978 | 7.9182 | 0.0120  | 0.7318 | 0.7318 | 0.6978 | 0.6978 | 1.179.307 | 1.179.307 | 0.2319 | 1.185.104 | 1,185.104 | 7 | 7 |
### 3.4 Grading - 2017

**Unmitigated Construction Off-Site**

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**Mitigated Construction On-Site**

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### 3.5 Building Construction - 2017

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#### Mitigated Construction On-Site

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### 3.5 Building Construction - 2018

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### 3.6 Paving - 2017

**Mitigated Construction Off-Site**

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### 3.7 Architectural Coating - 2017

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### 3.7 Architectural Coating - 2017

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### 3.7 Architectural Coating - 2017

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### 4.0 Operational Detail - Mobile

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4.2 Trip Summary Information

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5.0 Energy Detail
### 5.1 Mitigation Measures Energy

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<th>SO2 (lb/day)</th>
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<th>Exhaust PM10 (lb/day)</th>
<th>PM10 Total (lb/day)</th>
<th>Fugitive PM2.5 (lb/day)</th>
<th>Exhaust PM2.5 (lb/day)</th>
<th>PM2.5 Total (lb/day)</th>
<th>Bio- CO2e (lb/day)</th>
<th>N Bio- CO2e (lb/day)</th>
<th>Total CO2e (lb/day)</th>
<th>CH4 (lb/day)</th>
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### 5.2 Energy by Land Use - NaturalGas

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5.2 Energy by Land Use - NaturalGas

Mitigated

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6.0 Area Detail

6.1 Mitigation Measures Area
### 6.2 Area by SubCategory

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### 7.0 Water Detail
### 7.1 Mitigation Measures Water

### 8.0 Waste Detail

### 8.1 Mitigation Measures Waste

### 9.0 Operational Offroad

#### 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

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<th>Equipment Type</th>
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**Boilers**

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**User Defined Equipment**

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### 11.0 Vegetation
1.0 Project Characteristics

1.1 Land Usage

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1.2 Other Project Characteristics

- Urbanization: Urban
- Wind Speed (m/s): 2.6
- Precipitation Freq (Days): 40
- Climate Zone: 13
- Operational Year: 2019
- CO2 Intensity (lb/MWhr): 720.49
- CH4 Intensity (lb/MWhr): 0.029
- N2O Intensity (lb/MWhr): 0.006

1.3 User Entered Comments & Non-Default Data
Project Characteristics -

Land Use - Total new square footage of 6,300 SF (proposed Building A additions) + 7,000 SF (proposed open terrace area) = 13,300 SF. Restaurant use is included within “university” land use in CalEEMod. Would add 24 spaces and 4,357 sf of new pavement for extra parking spaces.

Construction Phase - Site preparation, grading, and construction are anticipated to begin in June 2017 and be completed by the beginning of the 2018 academic year in September 2018.

Grading - · Cleared/grubbed area = 0.347 acres
· Graded area = 0.457 acres

Demolition -

Vehicle Emission Factors -

Vehicle Emission Factors -

Vehicle Emission Factors -

Construction Off-road Equipment Mitigation - · Default fuel type
· Tier 2 engine type
· Default DPF level

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## 2.1 Overall Construction (Maximum Daily Emission)

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<th>Fugitive PM2.5</th>
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<th>Bio- CO2</th>
<th>NBio- CO2</th>
<th>Total CO2</th>
<th>CH4</th>
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### Mitigated Construction

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<th>NBio- CO2</th>
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### Percent Reduction

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## 2.2 Overall Operational

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<th>Total CO2 lg/day</th>
<th>CH4 lb/day</th>
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### Mitigated Operational

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### 3.0 Construction Detail

#### Construction Phase

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Acres of Grading (Site Preparation Phase): 0.347

Acres of Grading (Grading Phase): 0.457

Acres of Paving: 0.100023

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 19,950; Non-Residential Outdoor: 6,650; Striped Parking Area: 261

(Architectural Coating – sqft)

**OffRoad Equipment**
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3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment
Use Soil Stabilizer
Replace Ground Cover
Water Exposed Area
Reduce Vehicle Speed on Unpaved Roads
Clean Paved Roads

3.2 Demolition - 2017

Unmitigated Construction On-Site

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### 3.2 Demolition - 2017

#### Unmitigated Construction Off-Site

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#### Mitigated Construction On-Site

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### 3.2 Demolition - 2017

#### Mitigated Construction Off-Site

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<th>Bio-CO2 lb/day</th>
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### 3.3 Site Preparation - 2017

#### Unmitigated Construction On-Site

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### 3.3 Site Preparation - 2017

#### Unmitigated Construction Off-Site

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#### Mitigated Construction On-Site

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### 3.3 Site Preparation - 2017

#### 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 |
|----------------|------|------|------|------|---------------|--------------|------------|---------------|--------------|------------|----------|---------|-----------|-----------|------|------|------|
| 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         | 0.0265 | 0.0195 | 0.1842 | 0.0411 | 3.0000e-004   | 0.0109       | 0.0112     | 43.3359       | 43.3359     | 1.6300e-003 | 43.3768 |      |         |           |      |      |      |
| Total          | 0.0265 | 0.0195 | 0.1842 | 4.4000e-004 | 3.0000e-004 | 0.0414      | 2.8000e-004 | 43.3359       | 43.3359     | 1.6300e-003 | 43.3768 |      |         |           |      |      |      |

### 3.4 Grading - 2017

#### 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 |
|----------------|------|------|------|------|---------------|--------------|------------|---------------|--------------|------------|----------|---------|-----------|-----------|------|------|------|
| Fugitive Dust  | 0.7851 | 0.0000 | 0.7851 | 0.4173 | 0.0000      | 0.4173       | 1.179307   | 1.179307     | 0.2319      | 1.185104    |         |         |           |          |      |      |      |
| Off-Road       | 1.2100 | 10.4978 | 7.9182 | 0.0120 | 0.7318       | 0.7318       | 0.6978     | 1.179307     | 1.179307     | 0.2319      | 1.185104 |         |           |          |      |      |      |
| Total          | 1.2100 | 10.4978 | 7.9182 | 0.0120 | 0.7851       | 0.7318       | 1.5168     | 0.4173       | 0.6978       | 1.1150      | 1.179307 | 1.179307 | 0.2319    | 1.185104 |      |      |      |
### 3.4 Grading - 2017

#### Unmitigated Construction Off-Site

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#### Mitigated Construction On-Site

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### 3.4 Grading - 2017

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#### 3.5 Building Construction - 2017

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### 3.5 Building Construction - 2017

#### Unmitigated Construction Off-Site

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#### Mitigated Construction On-Site

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### 3.5 Building Construction - 2017

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### 3.5 Building Construction - 2018

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### 3.5 Building Construction - 2018

#### 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   |
|------------------|-------|--------|--------|--------|---------------|--------------|------------|---------------|--------------|------------|------------|------------|-----------|----------|--------|--------|--------|
| 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           | 0.0161| 0.3959 | 0.1158 | 8.2000e-004 | 0.0203        | 3.1400e-003  | 0.0235     | 5.8500e-003  | 3.0100e-003  | 8.8500e-003 | 87.2094    | 87.2094    | 7.5500e-003 | 87.3980 |
| Worker           | 0.0337| 0.0241 | 0.2273 | 5.9000e-004 | 0.0575        | 4.1000e-004  | 0.0579     | 3.8000e-004  | 0.0153       | 0.0156     | 58.9629    | 58.9629    | 2.0400e-003 | 59.0140 |
| Total            | 0.0498| 0.4200 | 0.3431 | 1.4100e-003 | 0.0778        | 3.5500e-003  | 0.0814     | 0.0211       | 3.3900e-003  | 0.0245     | 146.1723   | 146.1723   | 9.5900e-003 | 146.4120 |

#### 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   |
|------------------|-------|--------|--------|--------|---------------|--------------|------------|---------------|--------------|------------|------------|------------|-----------|----------|--------|--------|--------|
| Off-Road         | 0.4704| 10.7018| 7.9624 | 0.0114 | 0.3855        | 0.3855       | 0.3855     | 0.3855        | 0.3855       | 0.3855     | 0.0000     | 1,146.532  | 3         | 0.3569   | 1,155.455 |
| Total            | 0.4704| 10.7018| 7.9624 | 0.0114 | 0.3855        | 0.3855       | 0.3855     | 0.3855        | 0.3855       | 0.3855     | 0.0000     | 1,146.532  | 3         | 0.3569   | 1,155.455 |
### 3.5 Building Construction - 2018

#### 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 |
|------------|------|------|------|------|---------------|--------------|------------|---------------|--------------|------------|-----------|-----------|-----------|----------|-----|-----|------|
| 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     | 0.0161 | 0.3959 | 0.1158 | 8.2000e-004 | 0.0203 | 3.1400e-003 | 0.0235 | 5.8500e-003 | 3.0100e-003 | 8.8500e-003 | 87.2094 | 87.2094 | 7.5500e-003 | 87.3980 |
| Worker     | 0.0337 | 0.0241 | 0.2273 | 9.9000e-004 | 0.0575 | 4.0000e-004 | 0.0579 | 3.8000e-004 | 0.0156 | 59.0140 | 58.9629 | 2.0400e-003 | 59.0140 |
| Total      | 0.0498 | 0.4200 | 0.3431 | 1.4100e-003 | 0.0778 | 3.5500e-003 | 0.0814 | 3.3900e-003 | 0.0245 | 146.1723 | 146.1723 | 9.5900e-003 | 146.4120 |

### 3.6 Paving - 2017

#### 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 |
|------------|------|------|------|------|---------------|--------------|------------|---------------|--------------|------------|-----------|-----------|-----------|----------|-----|-----|------|
| Off-Road   | 1.0532 | 9.9754 | 7.3425 | 0.0113 | 0.6087 | 0.6087 | 0.5636 | 0.5636 | 1,085.107 | 1,085.107 | 0.3018 | 0.3018 | 1,092.651 |
| Paving     | 0.0131 | 0.0000 | 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      | 1.0663 | 9.9754 | 7.3425 | 0.0113 | 0.6087 | 0.6087 | 0.5636 | 0.5636 | 1,085.107 | 1,085.107 | 0.3018 | 0.3018 | 1,092.651 |
### 3.6 Paving - 2017

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### 3.7 Architectural Coating - 2017
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### 3.7 Architectural Coating - 2017

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**Mitigated Construction Off-Site**

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### 4.0 Operational Detail - Mobile

### 4.1 Mitigation Measures Mobile
### 4.2 Trip Summary Information

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### 4.3 Trip Type Information

#### Miles

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### 4.4 Fleet Mix

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<th>LHD1</th>
<th>LHD2</th>
<th>MHD</th>
<th>HHD</th>
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<th>UBUS</th>
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<td>0.001357</td>
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</table>

### 5.0 Energy Detail
### 5.1 Mitigation Measures Energy

| Category          | ROG    | NOx     | CO     | SO2    | Fugitive PM10 | Exhaust PM10 | PM10 Total | PM10 Total | PM10 Total | PM10 Total | PM10 Total | PM10 Total | Bio-CO2   | NBio-CO2 | Total CO2 | CH4 | N2O | CO2e |
|-------------------|--------|---------|--------|--------|---------------|--------------|------------|------------|------------|------------|------------|------------|------------|-----------|-----------|-----------|-----|-----|------|
| NaturalGas        |        |         |        |        |               |              |            |            |            |            |            |            |           |           |           |     |     |      |
| Mitigated        | 0.0143 | 0.1304  | 0.1095 | 7.8000e-004 | 9.9100e-003 | 9.9100e-003 | 9.9100e-003 | 9.9100e-003 | 156.4277   | 156.4277   | 3.0000e-003 | 2.8700e-003 | 157.3573   |
| Unmitigated      | 0.0143 | 0.1304  | 0.1095 | 7.8000e-004 | 9.9100e-003 | 9.9100e-003 | 9.9100e-003 | 9.9100e-003 | 156.4277   | 156.4277   | 3.0000e-003 | 2.8700e-003 | 157.3573   |

### 5.2 Energy by Land Use - NaturalGas

#### Unmitigated

| Land Use         | ROG    | NOx     | CO     | SO2    | Fugitive PM10 | Exhaust PM10 | PM10 Total | PM10 Total | PM10 Total | PM10 Total | PM10 Total | PM10 Total | Bio-CO2   | NBio-CO2 | Total CO2 | CH4 | N2O | CO2e |
|------------------|--------|---------|--------|--------|---------------|--------------|------------|------------|------------|------------|------------|------------|------------|-----------|-----------|-----------|-----|-----|------|
| 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   | 0.0000 |
| University/College (4Yr) | 1329.64 | 0.0143 | 0.1304 | 0.1095 | 7.8000e-004 | 9.9100e-003 | 9.9100e-003 | 9.9100e-003 | 9.9100e-003 | 156.4277   | 156.4277   | 3.0000e-003 | 2.8700e-003 | 157.3573   |
| Total            | 0.0143 | 0.1304  | 0.1095 | 7.8000e-004 | 9.9100e-003 | 9.9100e-003 | 9.9100e-003 | 9.9100e-003 | 156.4277   | 156.4277   | 3.0000e-003 | 2.8700e-003 | 157.3573   |
### 5.2 Energy by Land Use - NaturalGas

**Mitigated**

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<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
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<th>Total CO2</th>
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**6.0 Area Detail**

**6.1 Mitigation Measures Area**

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#### Mitigated

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### 7.0 Water Detail
7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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<th>Equipment Type</th>
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Boilers

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<th>Heat Input/Year</th>
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User Defined Equipment

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11.0 Vegetation
### 1.0 Project Characteristics

#### 1.1 Land Usage

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#### 1.2 Other Project Characteristics

- **Urbanization**: Urban
- **Wind Speed (m/s)**: 2.6
- **Precipitation Freq (Days)**: 40
- **Climate Zone**: 13
- **Operational Year**: 2019
- **Utility Company**: San Diego Gas & Electric
- **CO2 Intensity (lb/MWhr)**: 720.49
- **CH4 Intensity (lb/MWhr)**: 0.029
- **N2O Intensity (lb/MWhr)**: 0.006

#### 1.3 User Entered Comments & Non-Default Data
Project Characteristics -

Land Use - 6 existing faculty, 6 staff, 37 graduate students, and 5 postdoctoral scholars
Square Feet: 41,886 SF
Lot Acreage: 0.25688705 acres
Parking Lot spaces: 61; 17,000 SF; 0.39 acres

Construction Phase - Not accounting for construction in this run

Off-road Equipment -

Trips and VMT - Not accounting for construction in this run

Vehicle Trips - average daily trips = 96
trip rate = 1.607
employee = 0.8036
student = 0.8036

Vehicle Emission Factors -

Vehicle Emission Factors -

Sequestration - 37 trees added
- 11 torrey pines
- 6 marin strawberry trees
- 5 toyon trees
- 11 catalina cherry trees
- 4 small trees

Construction Off-road Equipment Mitigation - Only accounting for operational

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

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<tr>
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## 2.0 Emissions Summary

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### 2.1 Overall Construction

#### Unmitigated Construction

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### Percent Reduction

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## 2.2 Overall Operational

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### 2.2 Overall Operational

#### Mitigated Operational

| 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 |
|------------|---------|---------|---------|---------|---------------|--------------|------------|---------------|---------------|------------|------------|-----------|----------|--------|-----|-----|-----|
| Area       | 0.2011  | 1.0000e-005 | 1.1200e-003 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 2.1600e-003 | 2.1600e-003 | 1.0000e-005 | 0.0000 | 2.3100e-003 |
| Energy     | 6.8300e-003 | 0.0621 | 0.0521 | 3.7000e-004 | 4.7200e-003 | 4.7200e-003 | 4.7200e-003 | 4.7200e-003 | 0.0000 | 178.5957 | 178.5957 | 5.7600e-003 | 2.1600e-003 | 179.3844 |
| Mobile     | 0.0654 | 0.2836 | 0.7483 | 2.2400e-003 | 2.5700e-003 | 2.5700e-003 | 2.5700e-003 | 2.5700e-003 | 0.0000 | 206.4641 | 206.4641 | 0.0119 | 0.0000 | 206.7620 |
| Waste      | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.9942 | 0.9942 | 0.0588 | 0.0000 | 0.0000 | 2.4630 |
| Water      | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0542 | 1.8662 | 1.9204 | 5.6400e-003 | 1.5000e-004 | 2.1053 |
| Total      | 0.2733 | 0.3457 | 0.8016 | 2.6100e-003 | 7.2900e-003 | 0.1105 | 0.0294 | 7.1400e-003 | 0.0365 | 1.0484 | 386.9281 | 387.9765 | 0.0821 | 2.3100e-003 | 390.7169 |

#### Percent Reduction

| Percent Reduction | 4.93 | 4.53 | 2.68 | 4.74 | 1.99 | 12.27 | 2.75 | 12.50 | 4.25 | 74.08 | 8.68 | 9.30 | 68.55 | 16.00 | 10.20 |
2.3 Vegetation

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| New Trees | 25.4260 |
| Total     | 25.4260 |

3.0 Construction Detail

**Construction Phase**

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Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.39

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

**OffRoad Equipment**
### 3.2 Building Construction - 2017

#### Unmitigated Construction On-Site

<table>
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<tr>
<th>Category</th>
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### 3.2 Building Construction - 2017

#### Unmitigated Construction Off-Site

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#### Mitigated Construction On-Site

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3.2 Building Construction - 2017

Mitigated Construction Off-Site

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4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network
4.2 Trip Summary Information

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Average Daily Trip Rate</th>
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<td>Sunday</td>
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4.3 Trip Type Information

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<td>H-O or C-NW</td>
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## 5.0 Energy Detail

### 5.1 Mitigation Measures Energy

#### Exceed Title 24

Install High Efficiency Lighting

---

### Historical Energy Use: N

---

### 4.4 Fleet Mix

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<th>LDT2</th>
<th>MDV</th>
<th>LHD1</th>
<th>LHD2</th>
<th>MHD</th>
<th>HHD</th>
<th>OBUS</th>
<th>UBUS</th>
<th>MCY</th>
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<td>0.186694</td>
<td>0.113515</td>
<td>0.018244</td>
<td>0.005600</td>
<td>0.015197</td>
<td>0.022573</td>
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<td>0.002088</td>
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<td>0.000742</td>
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### 5.2 Energy by Land Use - NaturalGas

#### Unmitigated

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<th>NaturalGas Use</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO2</th>
<th>Fugitive PM10</th>
<th>Exhaust PM10</th>
<th>PM10 Total</th>
<th>Fugitive PM2.5</th>
<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio- CO2</th>
<th>N Bio- CO2</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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<td>5.6900e-003</td>
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#### Mitigated

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<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO2</th>
<th>Fugitive PM10</th>
<th>Exhaust PM10</th>
<th>PM10 Total</th>
<th>Fugitive PM2.5</th>
<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio- CO2</th>
<th>N Bio- CO2</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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### 5.3 Energy by Land Use - Electricity

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#### Mitigated

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<th>CO2e</th>
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### 6.0 Area Detail

### 6.1 Mitigation Measures Area
No Hearths Installed
Use Low VOC Cleaning Supplies

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<tr>
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<th>ROG</th>
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<th>SO2</th>
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<th>Exhaust PM10</th>
<th>PM10 Total</th>
<th>Fugitive PM2.5</th>
<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio-CO2</th>
<th>NBio-CO2</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
</tr>
</thead>
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6.2 Area by SubCategory

Unmitigated

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<th>SO2</th>
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<th>PM2.5 Total</th>
<th>Bio-CO2</th>
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<th>CO2e</th>
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6.2 Area by SubCategory

**Mitigated**

<table>
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<th>SO2</th>
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<th>Exhaust PM10</th>
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<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio- CO2</th>
<th>NBio- CO2</th>
<th>Total CO2</th>
<th>CH4</th>
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</tr>
<tr>
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</tr>
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</table>

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
### 7.2 Water by Land Use

#### Unmitigated

<table>
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<tr>
<th>Land Use</th>
<th>Indoor/Outdoor Use</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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<tbody>
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### 7.2 Water by Land Use

**Mitigated**

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<th>Indoor/Outdoor Use</th>
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<th>N2O</th>
<th>CO2e</th>
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<td>1.5000e-004</td>
<td>2.1053</td>
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</table>

### 8.0 Waste Detail

#### 8.1 Mitigation Measures Waste

Institute Recycling and Composting Services
### Category/Year

<table>
<thead>
<tr>
<th></th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mitigated</strong></td>
<td>0.9942</td>
<td>0.0588</td>
<td>0.0000</td>
<td>2.4630</td>
</tr>
<tr>
<td><strong>Unmitigated</strong></td>
<td>3.9766</td>
<td>0.2350</td>
<td>0.0000</td>
<td>9.8518</td>
</tr>
</tbody>
</table>

### 8.2 Waste by Land Use

#### Unmitigated

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Waste Disposed</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parking Lot</strong></td>
<td>0</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td><strong>University/College (4Yr)</strong></td>
<td>11.2</td>
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<td>0.1344</td>
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<tr>
<td><strong>University/College (4Yr)</strong></td>
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<tr>
<td><strong>Total</strong></td>
<td>3.9766</td>
<td>0.2350</td>
<td>0.0000</td>
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</tr>
</tbody>
</table>
### 8.2 Waste by Land Use

**Mitigated**

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Waste Disposed</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking Lot</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
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</table>

### 9.0 Operational Offroad

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Number</th>
<th>Hours/Day</th>
<th>Days/Year</th>
<th>Horse Power</th>
<th>Load Factor</th>
<th>Fuel Type</th>
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</thead>
</table>

### 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Number</th>
<th>Hours/Day</th>
<th>Hours/Year</th>
<th>Horse Power</th>
<th>Load Factor</th>
<th>Fuel Type</th>
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</thead>
</table>

**Boilers**

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Number</th>
<th>Heat Input/Day</th>
<th>Heat Input/Year</th>
<th>Boiler Rating</th>
<th>Fuel Type</th>
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</table>

**User Defined Equipment**

<table>
<thead>
<tr>
<th>Equipment Type</th>
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### 11.0 Vegetation

<table>
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<th>MT</th>
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<tbody>
<tr>
<td>Unmitigated</td>
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<tr>
<td>Total CO₂</td>
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</tr>
<tr>
<td>CH₄</td>
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<tr>
<td>N₂O</td>
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<td>CO₂e</td>
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### 11.2 Net New Trees

#### Species Class

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<th>CH₄</th>
<th>N₂O</th>
<th>CO₂e</th>
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<td>Miscellaneous</td>
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<td>Pine</td>
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<td>25.4260</td>
<td>0.0000</td>
<td>0.0000</td>
<td>25.4260</td>
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</table>
1.0 Project Characteristics

1.1 Land Usage

<table>
<thead>
<tr>
<th>Land Uses</th>
<th>Size</th>
<th>Metric</th>
<th>Lot Acreage</th>
<th>Floor Surface Area</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>University/College (4Yr)</td>
<td>46.00</td>
<td>Student</td>
<td>0.13</td>
<td>20,943.00</td>
<td>0</td>
</tr>
<tr>
<td>University/College (4Yr)</td>
<td>14.00</td>
<td>Employee</td>
<td>0.13</td>
<td>20,943.00</td>
<td>0</td>
</tr>
<tr>
<td>Parking Lot</td>
<td>61.00</td>
<td>Space</td>
<td>0.39</td>
<td>17,000.00</td>
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1.2 Other Project Characteristics

<table>
<thead>
<tr>
<th>Urbanization</th>
<th>Urban</th>
<th>Wind Speed (m/s)</th>
<th>2.6</th>
<th>Precipitation Freq (Days)</th>
<th>40</th>
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</thead>
<tbody>
<tr>
<td>Climate Zone</td>
<td>13</td>
<td>Operational Year</td>
<td>2019</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utility Company</td>
<td>San Diego Gas &amp; Electric</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO2 Intensity (lb/MWhr)</td>
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<td>CH4 Intensity (lb/MWhr)</td>
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<td>N2O Intensity (lb/MWhr)</td>
<td>0.006</td>
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1.3 User Entered Comments

Only CalEEMod defaults were used.
Project Characteristics -
Land Use - 6 existing faculty, 6 staff, 37 graduate students, and 5 postdoctoral scholars
Square Feet: 41,886 SF
Lot Acreage: 0.25688705 acres
Parking Lot spaces: 61; 17,000 SF; 0.39 acres
Construction Phase - Not accounting for construction in this run

Off-road Equipment -
Trips and VMT - Not accounting for construction in this run

Vehicle Trips - average daily trips = 96
trip rate = 1.607
employee = 0.8036
student = 0.8036

Vehicle Emission Factors -

Sequestration - 37 trees added
- 11 torrey pines
- 6 marin strawberry trees
- 5 toyon trees
- 11 catalina cherry trees
- 4 small trees

Construction Off-road Equipment Mitigation - Only accounting for operational

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

2.0 Peak Daily Emissions
### Peak Daily Construction Emissions

#### Unmitigated

<table>
<thead>
<tr>
<th>Year</th>
<th>Phase</th>
<th>ROG</th>
<th>NOX</th>
<th>CO</th>
<th>SO2</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>Building Construction</td>
<td>1.2812 S</td>
<td>12.7589 S</td>
<td>8.0700 S</td>
<td>0.0114 S</td>
<td>0.8591 S</td>
<td>0.7904 S</td>
</tr>
<tr>
<td></td>
<td>Peak Daily Total</td>
<td>1.2812 S</td>
<td>12.7589 S</td>
<td>8.0700 S</td>
<td>0.0114 S</td>
<td>0.8591 S</td>
<td>0.7904 S</td>
</tr>
</tbody>
</table>

#### Mitigated

<table>
<thead>
<tr>
<th>Year</th>
<th>Phase</th>
<th>ROG</th>
<th>NOX</th>
<th>CO</th>
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<th>PM10</th>
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<td>8.0700 S</td>
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<td>0.8591 S</td>
<td>0.7904 S</td>
</tr>
<tr>
<td></td>
<td>Peak Daily Total</td>
<td>1.2812 S</td>
<td>12.7589 S</td>
<td>8.0700 S</td>
<td>0.0114 S</td>
<td>0.8591 S</td>
<td>0.7904 S</td>
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</table>

Exceed Significance?

### Peak Daily Operational Emissions

#### Unmitigated

<table>
<thead>
<tr>
<th>Operational Activity</th>
<th>ROG</th>
<th>NOX</th>
<th>CO</th>
<th>SO2</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-Site Area</td>
<td>1.1695 S</td>
<td>1.2000e-004 S</td>
<td>0.0125 S</td>
<td>0.0000 S</td>
<td>4.0000e-005 S</td>
<td>4.0000e-005 S</td>
</tr>
<tr>
<td>On-Site Energy</td>
<td>0.0452 S</td>
<td>0.4105 S</td>
<td>0.3449 S</td>
<td>2.4600e-003 S</td>
<td>0.0312 S</td>
<td>0.3400 S</td>
</tr>
<tr>
<td>Off-Site Mobile</td>
<td>0.3817 S</td>
<td>1.5736 W</td>
<td>4.2610 S</td>
<td>0.0131 S</td>
<td>0.6053 W</td>
<td>0.1812 W</td>
</tr>
<tr>
<td>Peak Daily Total</td>
<td>1.5964 S</td>
<td>1.9843 W</td>
<td>4.6184 S</td>
<td>0.0156 S</td>
<td>0.6365 W</td>
<td>0.2125 W</td>
</tr>
</tbody>
</table>

#### Mitigated

<table>
<thead>
<tr>
<th>Operational Activity</th>
<th>ROG</th>
<th>NOX</th>
<th>CO</th>
<th>SO2</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0.0125 S</td>
<td>0.0000 S</td>
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<td>4.0000e-005 S</td>
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<tr>
<td>On-Site Energy</td>
<td>0.0452 S</td>
<td>0.4105 S</td>
<td>0.3449 S</td>
<td>2.4600e-003 S</td>
<td>0.0312 S</td>
<td>0.3400 S</td>
</tr>
<tr>
<td>Off-Site Mobile</td>
<td>0.3817 S</td>
<td>1.5736 W</td>
<td>4.2610 S</td>
<td>0.0131 S</td>
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<td>0.1812 W</td>
</tr>
<tr>
<td>Peak Daily Total</td>
<td>1.5964 S</td>
<td>1.9843 W</td>
<td>4.6184 S</td>
<td>0.0156 S</td>
<td>0.6365 W</td>
<td>0.2125 W</td>
</tr>
</tbody>
</table>

Exceed Significance?

### 3.0 Annual GHG Emissions

#### Annual GHG
### Annual GHG

<table>
<thead>
<tr>
<th>GHG Activity</th>
<th>Year</th>
<th>CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
<th>CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>2017</td>
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<td>0.5329</td>
<td>0.5289</td>
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<td>2019</td>
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<td></td>
</tr>
</tbody>
</table>
# 1.0 Project Characteristics

## 1.1 Land Usage

<table>
<thead>
<tr>
<th>Land Uses</th>
<th>Size</th>
<th>Metric</th>
<th>Lot Acreage</th>
<th>Floor Surface Area</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>University/College (4Yr)</td>
<td>46.00</td>
<td>Student</td>
<td>0.13</td>
<td>20,943.00</td>
<td>0</td>
</tr>
<tr>
<td>University/College (4Yr)</td>
<td>14.00</td>
<td>Employee</td>
<td>0.13</td>
<td>20,943.00</td>
<td>0</td>
</tr>
<tr>
<td>Parking Lot</td>
<td>61.00</td>
<td>Space</td>
<td>0.39</td>
<td>17,000.00</td>
<td>0</td>
</tr>
</tbody>
</table>

## 1.2 Other Project Characteristics

- **Urbanization**: Urban
- **Wind Speed (m/s)**: 2.6
- **Precipitation Freq (Days)**: 40
- **Climate Zone**: 13
- **Operational Year**: 2019
- **Utility Company**: San Diego Gas & Electric
- **CO2 Intensity (lb/MWhr)**: 720.49
- **CH4 Intensity (lb/MWhr)**: 0.029
- **N2O Intensity (lb/MWhr)**: 0.006

## 1.3 User Entered Comments & Non-Default Data
Project Characteristics -

Land Use - 6 existing faculty, 6 staff, 37 graduate students, and 5 postdoctoral scholars
Square Feet: 41,886 SF
Lot Acreage: 0.2568705 acres
Parking Lot spaces: 61; 17,000 SF; 0.39 acres

Construction Phase - Not accounting for construction in this run

Off-road Equipment -

Trips and VMT - Not accounting for construction in this run

Vehicle Trips - average daily trips = 96
trip rate = 1.607
employee = 0.8036
student: = 0.8036

Vehicle Emission Factors -

Vehicle Emission Factors -
Sequestration - 37 trees added
- 11 torrey pines
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Construction Off-road Equipment Mitigation - Only accounting for operational

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Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

<table>
<thead>
<tr>
<th>Table Name</th>
<th>Column Name</th>
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## 2.0 Emissions Summary

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<td>2019</td>
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</table>
### 2.1 Overall Construction (Maximum Daily Emission)

#### Unmitigated Construction

<table>
<thead>
<tr>
<th>Year</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO2</th>
<th>Fugitive PM10</th>
<th>Exhaust PM10</th>
<th>PM10 Total</th>
<th>Fugitive PM2.5</th>
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#### Mitigated Construction

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#### Percent Reduction

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## 2.2 Overall Operational

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### Mitigated Operational

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<th>SO2</th>
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<th>Exhaust PM10</th>
<th>PM10 Total</th>
<th>Fugitive PM2.5</th>
<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio-CO2</th>
<th>NBio-CO2</th>
<th>Total CO2</th>
<th>CH4</th>
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### 3.0 Construction Detail

#### Construction Phase

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<th>Start Date</th>
<th>End Date</th>
<th>Num Days Week</th>
<th>Num Days</th>
<th>Phase Description</th>
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<tbody>
<tr>
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<td>6/1/2017</td>
<td>5</td>
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#### Acres of Grading
- **Site Preparation Phase**: 0
- **Grading Phase**: 0
- **Paving**: 0.39

**Residential Indoor**: 0; **Residential Outdoor**: 0; **Non-Residential Indoor**: 0; **Non-Residential Outdoor**: 0; **Striped Parking Area**: 0 (Architectural Coating – sqft)

#### OffRoad Equipment

<table>
<thead>
<tr>
<th>Phase Name</th>
<th>Offroad Equipment Type</th>
<th>Amount</th>
<th>Usage Hours</th>
<th>Horse Power</th>
<th>Load Factor</th>
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#### Trips and VMT

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<th>Vendor Trip Number</th>
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<th>Worker Trip Length</th>
<th>Vendor Trip Length</th>
<th>Hauling Trip Length</th>
<th>Worker Vehicle Class</th>
<th>Vendor Vehicle Class</th>
<th>Hauling Vehicle Class</th>
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### 3.1 Mitigation Measures Construction

**Clean Paved Roads**

### 3.2 Building Construction - 2017

**Unmitigated Construction On-Site**

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<tr>
<th>Category</th>
<th>ROG</th>
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<th>CO</th>
<th>SO2</th>
<th>Fugitive PM10</th>
<th>Exhaust PM10</th>
<th>PM10 Total</th>
<th>Fugitive PM2.5</th>
<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio- CO2</th>
<th>NBio- CO2</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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<tbody>
<tr>
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### 3.2 Building Construction - 2017

#### Unmitigated Construction Off-Site

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#### Mitigated Construction On-Site

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3.2 Building Construction - 2017
Mitigated Construction Off-Site

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4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network
### 4.2 Trip Summary Information

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<td>11.25</td>
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<tr>
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<tr>
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### 4.3 Trip Type Information

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<th>Trip Purpose %</th>
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<td>H-S or C-C</td>
<td>H-O or C-NW</td>
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<tr>
<td>University/College (4Yr)</td>
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4.4 Fleet Mix

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<th>LHD2</th>
<th>MHD</th>
<th>HHD</th>
<th>OBUS</th>
<th>UBUS</th>
<th>MCY</th>
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<th>MH</th>
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</thead>
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<td>0.018244</td>
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5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24
Install High Efficiency Lighting

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<th>SO2</th>
<th>Fugitive</th>
<th>Exhaust</th>
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<th>Fugitive</th>
<th>Exhaust</th>
<th>PM2.5</th>
<th>Bio-CO2</th>
<th>NBio-CO2</th>
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<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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<tr>
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## 5.2 Energy by Land Use - Natural Gas

### Unmitigated

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### Mitigated

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<th>PM2.5 Total</th>
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## 6.0 Area Detail

### 6.1 Mitigation Measures Area
No Hearths Installed
Use Low VOC Cleaning Supplies

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<th>NBio-CO2</th>
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<td>4.0000e-005</td>
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6.2 Area by SubCategory

Mitigated

<table>
<thead>
<tr>
<th>SubCategory</th>
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<th>SO2</th>
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<th>CO2e</th>
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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

Institute Recycling and Composting Services
9.0 Operational Offroad

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Number</th>
<th>Hours/Day</th>
<th>Days/Year</th>
<th>Horse Power</th>
<th>Load Factor</th>
<th>Fuel Type</th>
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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<th>Number</th>
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<th>Hours/Year</th>
<th>Horse Power</th>
<th>Load Factor</th>
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Boilers

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User Defined Equipment

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11.0 Vegetation
1.0 Project Characteristics

1.1 Land Usage

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<th>Metric</th>
<th>Lot Acreage</th>
<th>Floor Surface Area</th>
<th>Population</th>
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1.2 Other Project Characteristics

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<table>
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<tr>
<th>CO2 Intensity (lb/MWhr)</th>
<th>CH4 Intensity (lb/MWhr)</th>
<th>N2O Intensity (lb/MWhr)</th>
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1.3 User Entered Comments & Non-Default Data
Project Characteristics -

Land Use - 6 existing faculty, 6 staff, 37 graduate students, and 5 postdoctoral scholars
Square Feet: 41,886 SF
Lot Acreage: 0.2568705 acres
Parking Lot spaces: 61; 17,000 SF; 0.39 acres

Construction Phase - Not accounting for construction in this run

Off-road Equipment -

Trips and VMT - Not accounting for construction in this run

Vehicle Trips - average daily trips = 96
trip rate = 1.607
employee = 0.8036
student = 0.8036

Vehicle Emission Factors -

Vehicle Emission Factors -

Sequestration - 37 trees added
- 11 torrey pines
- 6 marin strawberry trees
- 5 toyon trees
- 11 catalina cherry trees
- 4 small trees

Construction Off-road Equipment Mitigation - Only accounting for operational

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

<table>
<thead>
<tr>
<th>Table Name</th>
<th>Column Name</th>
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### 2.0 Emissions Summary

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2.1 Overall Construction (Maximum Daily Emission)

**Unmitigated Construction**

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<th>SO2</th>
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**Mitigated Construction**

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**Percent Reduction**

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## 2.2 Overall Operational

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### Mitigated Operational

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<th>NBio-CO2</th>
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3.0 Construction Detail

### Construction Phase

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<th>Num Days</th>
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Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.39

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

### OffRoad Equipment

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<th>Offroad Equipment Type</th>
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<th>Usage Hours</th>
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### Trips and VMT

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### 3.1 Mitigation Measures Construction

**Clean Paved Roads**

### 3.2 Building Construction - 2017

**Unmitigated Construction On-Site**

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<th>SO2</th>
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<th>Exhaust PM10</th>
<th>PM10 Total</th>
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<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio- CO2</th>
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<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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<tbody>
<tr>
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### 3.2 Building Construction - 2017

#### Unmitigated Construction Off-Site

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#### Mitigated Construction On-Site

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3.2 Building Construction - 2017
Mitigated Construction Off-Site

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4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network
### 4.2 Trip Summary Information

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<thead>
<tr>
<th>Land Use</th>
<th>Average Daily Trip Rate</th>
<th>Unmitigated</th>
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### 4.3 Trip Type Information

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<th>Miles</th>
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<td>H-S or C-C</td>
<td>H-O or C-NW</td>
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5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24
Install High Efficiency Lighting

---

### 4.4 Fleet Mix

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<th>Land Use</th>
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<th>LDT2</th>
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<th>LHD1</th>
<th>LHD2</th>
<th>MHD</th>
<th>HHD</th>
<th>OBUS</th>
<th>UBUS</th>
<th>MOY</th>
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</thead>
<tbody>
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<td>0.044135</td>
<td>0.186694</td>
<td>0.113515</td>
<td>0.018244</td>
<td>0.005600</td>
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<td>0.001888</td>
<td>0.002088</td>
<td>0.006279</td>
<td>0.000742</td>
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### 5.0 Energy Detail

#### 5.1 Mitigation Measures Energy

- Exceed Title 24
- Install High Efficiency Lighting
### 5.2 Energy by Land Use - NaturalGas

#### Unmitigated

<table>
<thead>
<tr>
<th>Land Use</th>
<th>NaturalGas Use</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO2</th>
<th>Fugitive PM10</th>
<th>Exhaust PM10</th>
<th>PM10 Total</th>
<th>Fugitive PM2.5</th>
<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio- CO2</th>
<th>NBio- CO2</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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<tr>
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<tr>
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#### Mitigated

<table>
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<tr>
<th>Land Use</th>
<th>NaturalGas Use</th>
<th>ROG</th>
<th>NOx</th>
<th>CO</th>
<th>SO2</th>
<th>Fugitive PM10</th>
<th>Exhaust PM10</th>
<th>PM10 Total</th>
<th>Fugitive PM2.5</th>
<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio- CO2</th>
<th>NBio- CO2</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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### 6.0 Area Detail

#### 6.1 Mitigation Measures Area
No Hearths Installed
Use Low VOC Cleaning Supplies

### 6.2 Area by SubCategory

#### Unmitigated

<table>
<thead>
<tr>
<th>SubCategory</th>
<th>ROG (lb/day)</th>
<th>NOx (lb/day)</th>
<th>CO (lb/day)</th>
<th>SO2 (lb/day)</th>
<th>Fugitive PM10 (lb/day)</th>
<th>Exhaust PM10 (lb/day)</th>
<th>PM10 Total (lb/day)</th>
<th>Fugitive PM2.5 (lb/day)</th>
<th>Exhaust PM2.5 (lb/day)</th>
<th>PM2.5 Total (lb/day)</th>
<th>Bio-CO2 (lb/day)</th>
<th>NBio-CO2 (lb/day)</th>
<th>Total CO2 (lb/day)</th>
<th>CH4 (lb/day)</th>
<th>N2O (lb/day)</th>
<th>CO2e (lb/day)</th>
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</thead>
<tbody>
<tr>
<td>Architectural Coating</td>
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<td>4.0000e-005</td>
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6.2 Area by SubCategory

Mitigated

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<th>SO2</th>
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<th>Exhaust PM10</th>
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<th>Exhaust PM2.5</th>
<th>PM2.5 Total</th>
<th>Bio- CO2</th>
<th>NBio- CO2</th>
<th>Total CO2</th>
<th>CH4</th>
<th>N2O</th>
<th>CO2e</th>
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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

Institute Recycling and Composting Services
### 9.0 Operational Offroad

<table>
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### 10.0 Stationary Equipment

#### Fire Pumps and Emergency Generators

<table>
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<tr>
<th>Equipment Type</th>
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<th>Hours/Year</th>
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<th>Load Factor</th>
<th>Fuel Type</th>
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</table>

#### Boilers

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<th>Boiler Rating</th>
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#### User Defined Equipment

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### 11.0 Vegetation