Tiered Initial Study/Mitigated Negative Declaration to Final Environmental Impact Report
SCH # 2007061092

Technical Appendices

Campus Master Plan Update
California State University, Long Beach

Peterson Hall 1 Replacement Building Project

California State University, Long Beach

1250 Bellflower Boulevard

Long Beach, California 90840

May 2022

TECHNICAL APPENDICES
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APPENDIX A

Air Quality Assessment

Technical Memorandum

TO: Jane Change
AECOM Technical Services Inc.

FROM: Terry A. Hayes Associates Inc.

DATE: May 18, 2022

RE: California State University, Long Beach (CSULB) Peterson Hall 1 Replacement Project – Air Quality Assessment

Introduction

This Air Quality Assessment for the CSULB Peterson Hall 1 Replacement Project (proposed project) analyzes the potential environmental impacts associated with the implementation of the Peterson Hall 1 Replacement Building Project (proposed project) on the CSULB campus. The existing Peterson Hall 1 (PH1) building was proposed for demolition and replacement in the Campus Master Plan and Campus Master Plan Update EIR (State Clearinghouse #2007061092), certified by the CSU Board of Trustees in May 2008 (2008 EIR). CSULB now proposes to implement this project with modifications compared to its original description in the 2008 Campus Master Plan, necessitating the preparation of additional environmental analysis and documentation in conformance with the California Environmental Quality Act (CEQA) Guidelines.

Terry A. Hayes Associates Inc. (TAHA) has completed an Air Quality Assessment for the proposed project in accordance with provisions of CEQA Statutes and Guidelines. This Assessment is organized as follows:

- Project Description
- Air Quality Topical Information
- Regulatory Framework
- Existing Setting
- Significance Thresholds
- Methodology
- Impact Analysis
- References

Project Description

The proposed project is located in the City of Long Beach, California, specifically within the CSULB property. **Figure 1** shows the project location in the City of Long Beach, **Figure 2** shows the location of the proposed project within the CSULB boundary, and **Figure 3** shows the conceptual site plan of the proposed project.

The existing PH1 building was proposed for demolition and replacement in the 2008 EIR. CSULB now proposes to implement this project with modifications compared to its original description in the 2008 Campus Master Plan, necessitating the preparation of additional environmental analysis and documentation in conformance with the CEQA Guidelines. All applicable mitigation measures from the 2008 EIR would be applicable to the proposed project.

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Similar to the approved project, the current proposed project involves demolition of the existing PH1 building and temporary Faculty Office 5 (FO5) building as well as construction of a new building. In the time since the 2008 EIR, Peterson Hall 2 (PH2) has undergone a renovation, which included a small addition, rather than the originally contemplated replacement of the PH2 building. As such, PH2 would remain in use and is not part of the current proposed project. The 2008 Campus Master Plan proposed two new buildings to accommodate replacement lecture and laboratory space as well as approximately 170 faculty offices. Instead of constructing two new replacement buildings as contemplated in the 2008 EIR, the proposed project would construct one new three-story building. The proposed building would include lecture and lab space, as well as faculty offices, similar to the approved project.

In addition, the proposed project would include uses not originally contemplated in the 2008 EIR, including a public clinic to be operated in cooperation with a local Clinical Healthcare provider partner (clinical partner), under a teaching clinic model. The proposed project would also require demolition of the Faculty Office 4 (FO4) temporary building to accommodate a surface parking lot to serve the clinic, which was not originally contemplated for the approved project.

The proposed project site includes the existing PH1 building, FO4, FO5, and construction laydown and equipment storage areas, and is located in the southern portion of the campus, as shown in **Figure 2**. The proposed project would construct a new 137,072 gross square feet, three-story building for the College of Health and Human Services (CHHS) to replace the existing PH1 building, and the FO4 and FO5 temporary office buildings. The replacement facility would occupy the PH1 and FO5 building footprints. FO4 would become future additional surface parking.

The new building would include faculty space, student collaboration space, teaching labs, research labs, administration space, a medical simulation center, and a clinic to be operated in cooperation with a local regional hospital. Office construction would implement the CSULB office space standards of 90 ASF for faculty offices, which would provide the equivalent of 134 new faculty offices. The replacement building would be open to students during normal academic hours as well as evenings and weekends to support academic scheduling and student self-study needs.

The clinic would be based on a "teaching-clinic model" and would be located on the first floor of the replacement building. The clinic would operate Monday through Friday from 8:00 a.m. to 5:00 p.m. and would not have an urgent care component. FO4 would be demolished and replaced with a surface parking lot that would provide approximately 45 new dedicated parking spaces for the clinic, which would be available for use by the campus outside of clinic hours.

Construction of the proposed project is anticipated to take approximately 24 months to complete, commencing in September 2023 and concluding in September 2025.

Operations of the proposed project would generate an estimated 564 daily trips, including 52 morning peak hour trips (31 trips entering, 21 trips exiting), and 63 evening peak hour trips (29 trips entering, 34 trips exiting). This trip generation includes trips from the clinic staff, clinic patients, CSULB students, and CSULB employees.

Figure 1

Regional Map

Figure 2

Project Location Map

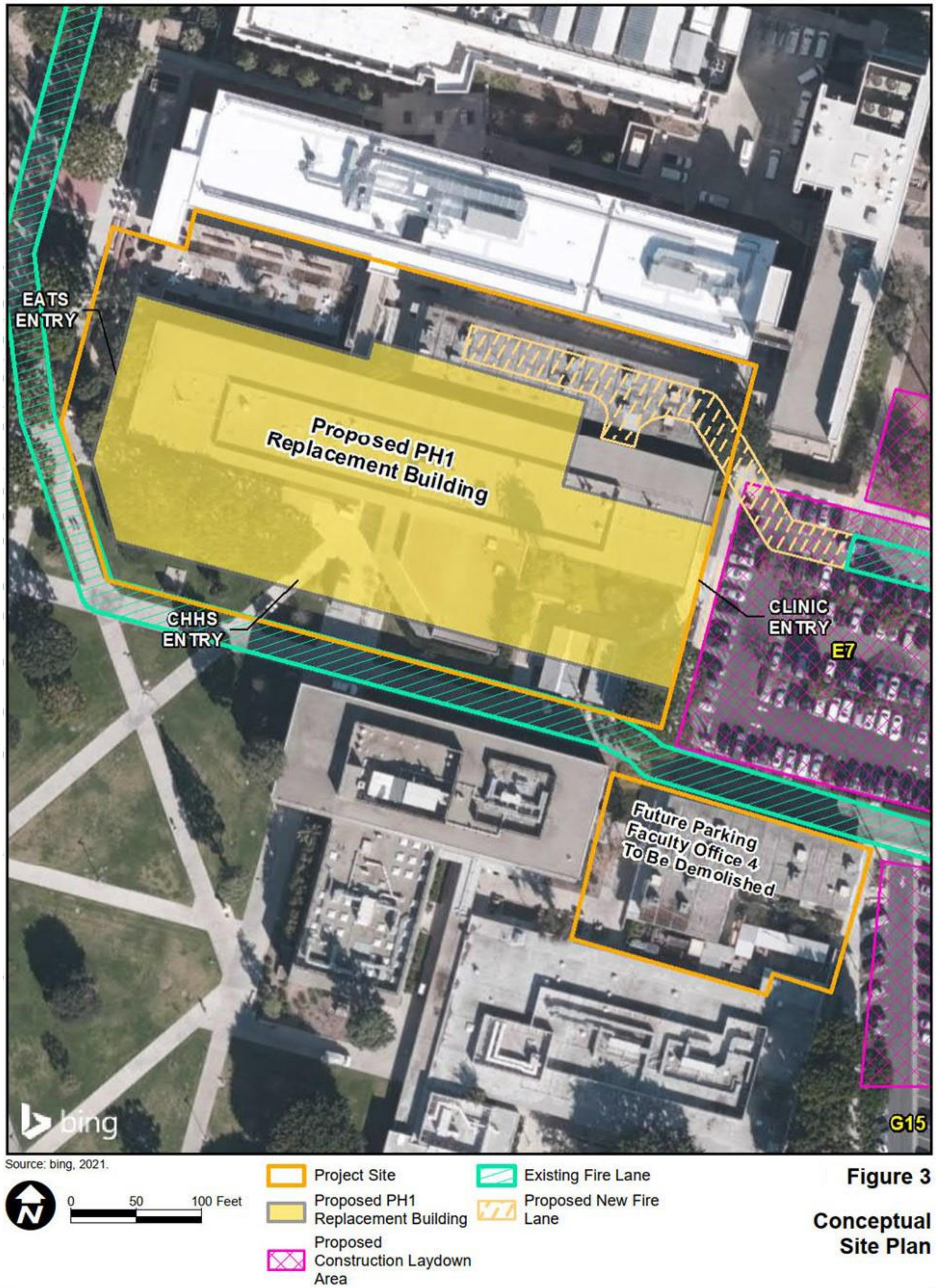

Figure 3

Conceptual Site Plan

Air Quality Topical Information

Air quality is typically characterized by ambient air concentrations of seven specific pollutants identified by the United States Environmental Protection Agency (USEPA) to be of concern with respect to health and welfare of the general public. These specific pollutants, known as criteria air pollutants, are pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. These pollutants are common by products of human activities and have been documented through scientific research to cause adverse health effects. The federal ambient concentration criteria are known as the National Ambient Air Quality Standards (NAAQS), and the California ambient concentration criteria are referred to as the California Ambient Air Quality Standards (CAAQS). Federal criteria air pollutants include ground-level ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), respirable particulate matter ten microns or less in diameter (PM_{10}), fine particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), and lead. In addition to the federal criteria pollutants, the state regulates visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride.

Air toxics are generally defined as those contaminants that are known or suspected to cause serious health problems, but do not have a corresponding ambient air quality standard. Air toxics are also defined as an air pollutant that may increase a person’s risk of developing cancer and/or other serious health effects; however, the emission of a toxic chemical does not automatically create a health hazard. Air toxics include, but are not limited to, diesel PM, metals, gases absorbed by particles, and certain vapors from fuels and other sources.

Regulatory Framework

The following discussion includes relevant regulations, policies, and programs that have been adopted by federal, state, regional, and local agencies to protect air quality and public health.

Federal

The Clean Air Act (CAA) governs air quality at the national level and the USEPA is responsible for enforcing the regulations provided in the CAA. Under the CAA, the USEPA is authorized to establish NAAQS that set protective limits on concentrations of air pollutants in ambient air. Enforcement of the NAAQS is required under the 1977 CAA and subsequent amendments. As required by the CAA, NAAQS have been established for the seven criteria air pollutants: O_3, NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and Pb. These pollutants are common byproducts of human activities and have been documented through scientific research to cause adverse health effects. The CAA grants the USEPA authority to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the NAAQS concentrations have been met on a regional scale relying upon air monitoring data from the most recent three-year period. The NAAQS are summarized in **Table 1**.

TABLE 1: AMBIENT AIR QUALITY STANDARDS AND ATTAINMENT STATUS DESIGNATIONS					
		California		Federal	
Pollutant	Averaging Period	Standards (CAAQS)	Attainment Status	Standards (NAAQS)	Attainment Status
Ozone (O_3)	1-Hour Average	0.09 ppm (180 μg/m^3)	Nonattainment	--	--
	8-Hour Average	0.070 ppm (137 μg/m^3)	Nonattainment	0.070 ppm (137 μg/m^3)	Nonattainment – Extreme
Carbon Monoxide (CO)	1-Hour Average	20 ppm (23 mg/m^3)	Attainment	35.0 ppm (40 mg/m^3)	Attainment
	8-Hour Average	9.0 ppm (10 mg/m^3)	Attainment	9.0 ppm (10 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	1-Hour Average	0.18 ppm (338 μg/m^3)	Attainment	0.10 ppm (188 μg/m^3)	Attainment
	Annual Arithmetic Mean	0.03 ppm (57 μg/m^3)	Attainment	0.053 ppm (100 μg/m^3)	Attainment
Sulfur Dioxide (SO_2)	1-Hour Average	0.25 ppm (655 μg/m^3)	Attainment	0.075 ppm (196 μg/m^3)	Attainment
	24-Hour Average	0.04 ppm (105 μg/m^3)	Attainment	0.14 ppm (365 μg/m^3)	Attainment
	Annual Arithmetic Mean	--	--	0.030 ppm (80 μg/m^3)	Attainment
Respirable Particulate Matter (PM_{10})	24-Hour Average	50 μg/m^3	Nonattainment	150 μg/m^3	Attainment (Maintenance)
	Annual Arithmetic Mean	20 μg/m^3	Nonattainment	--	--
Fine Particulate Matter ($PM_{2.5}$)	24-Hour Average	--	--	35 μg/m^3	Nonattainment
	Annual Arithmetic Mean	12 μg/m^3	Nonattainment	12.0 μg/m^3	Nonattainment
Lead (Pb)	30-day Average	1.5 μg/m^3	Attainment	--	--
	Calendar Quarter	--	--	1.5 μg/m^3	Unclassified/ Attainment
	Rolling 3-Month Average	--	--	0.15 μg/m^3	Unclassified/ Attainment
Sulfates	24-Hour Average	25 μg/m^3	Attainment	No Federal Standards	
Hydrogen Sulfide	1-Hour Average	0.03 ppm (42 μg/m^3)	Attainment		
Vinyl Chloride	24-Hour Average	0.01 ppm (26 μg/m^3)	Attainment		

CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard; ppm = parts per million; μg/m^3 = micrograms per cubic meter.

SOURCE: SCAQMD, *NAAQS and CAAQS Attainment Status for South Coast Air Basin*, October 2018.

State

Air quality in California is also governed by more stringent regulations under the California Clean Air Act (CCAA). The CCAA is administered by the California Air Resources Board (CARB) at the state level and by the air quality management districts at the regional and local levels. The CCAA requires all areas of the state to achieve and maintain the CAAQS by the earliest feasible date, which is determined in the most recent SIP based on existing emissions and reasonably foreseeable control measures that will be implemented in the future.

The CAAQS are also summarized in **Table 1**, which also presents the attainment status designations for the Los Angeles County portion of the SCAB. The CARB's statewide comprehensive air toxics program was established in the early 1980's. The Toxic Air Contaminant Identification and Control Act created California's program to reduce exposure to air toxics. Under the Toxic Air Contaminant Identification and Control Act, the CARB is required to prioritize the identification and control of air toxics emissions. In selecting substances for review, the CARB must consider criteria relating to the risk of harm to public health, such as amount or potential amount of emissions, manner of and exposure to usage of the substance in California, persistence in the atmosphere, and ambient concentrations in the community.

Regional

The 1977 Lewis Air Quality Management Act established the SCAQMD in order to coordinate air quality planning efforts throughout Southern California. The SCAQMD has jurisdiction over a total area of 10,743 square miles, consisting of the SCAB—which comprises 6,745 square miles including Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties—and the Riverside County portion of the Salton Sea and Mojave Desert Air Basins. The proposed project would be located in the City of Long Beach, which is situated in the SCAB portion of Los Angeles County and is within the jurisdiction of the SCAQMD.

The SCAQMD is tasked with preparing regional programs and policies designed to improve air quality within the SCAB, which are assessed and published in the form of the Air Quality Management Plan (AQMP). The AQMP is updated every four years to evaluate the effectiveness of the adopted programs and policies and to forecast attainment dates for nonattainment pollutants to support the State Implementation Plan based on measured regional air quality and anticipated implementation of new technologies and emissions reductions. The most recent publication is the 2016 AQMP, which is intended to serve as a regional blueprint for achieving the federal air quality standards and healthful air.

The 2016 AQMP represents a thorough analysis of existing and potential regulatory control options, and includes available, proven, and cost-effective strategies to pursue multiple goals in promoting reductions in GHG emissions and toxic risk, as well as efficiencies in energy use, transportation, and goods movement. The 2016 AQMP focuses on demonstrating NAAQS attainment dates for the 2008 8-hour O_3 standard, the 2012 annual $PM_{2.5}$ standard, and the 2006 24-hour $PM_{2.5}$ standard. The 2016 AQMP acknowledged that the most significant air quality challenge in the SCAB is the reduction of NO_X emissions sufficient to meet the upcoming ozone standard deadlines. The 2016 AQMP includes both stationary and mobile source strategies to ensure that rapidly approach attainment deadlines are met, that public health is protected to the maximum extent feasible, and that the region is not faced with burdensome sanctions if the NAAQS are not met by the established date.

The AQMP also includes an element that is related to transportation and sustainable communities planning. Pursuant to California Health and Safety Code Section 40450, the Southern California Association of Governments (SCAG) has the responsibility of preparing and approving the portions of the AQMP relating to regional demographic projections and integrated regional land use, housing, employment, and transportation programs, measures, and strategies. The analysis incorporated into the 2016 AQMP is based on the forecasts contained within the SCAG 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). SCAG approved the 2020-2045 RTP/SCS, although these growth projections have not been incorporated by SCAQMD into the current AQMP.

The SCAQMD has also established various rules to manage and improve air quality in the SCAB. The proposed project proponent would comply with all applicable SCAQMD Rules and Regulations pertaining to construction activities, including, but not limited to:

- Rule 402 (Nuisance) states that a person should not emit air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.
- Rule 403 (Fugitive Dust) controls fugitive dust through various requirements including, but not limited to, applying water in sufficient quantities to prevent the generation of visible dust plumes, applying soil binders to uncovered areas, reestablishing ground cover as quickly as possible, utilizing a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site, limiting vehicle speeds on unpaved roads to 15 miles per hour, and maintaining effective cover over exposed areas. Rule 403 also prohibits the release of fugitive dust emissions from any active operation, open storage piles, or disturbed surface area beyond the property line of the emission source and prohibits particulate matter deposits on public roadways.

Existing Setting

The South Coast Air Basin (SCAB) is subject to high levels of air pollution due to the immense magnitude of emissions sources and the combination of topography, low mean atmospheric mixing height, and abundant sunshine. Although the SCAB has a semiarid climate, air near the surface is generally moist because of the presence of a shallow marine layer. With very low average wind speeds, there is a limited capacity to disperse air contaminants horizontally. The mountains and hills surrounding the SCAB contribute to the variation of rainfall, temperature, and winds throughout the region. During the spring and early summer, pollution produced during any one day is typically blown out of the SCAB through mountain passes or lifted by warm, vertical currents adjacent to mountain slopes. The vertical dispersion of air pollutants in the SCAB is limited by temperature inversions in the atmosphere close to the Earth’s surface. The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. On days of no inversion or high wind speeds, ambient air pollutant concentrations are lowest. During periods of low inversions and low wind speeds, air pollutants become more concentrated in urbanized areas with pollution sources of greater magnitude.

Air quality within the SCAB region is characterized by concentrations of air pollutants measured at 37 monitoring stations located throughout the South Coast Air Quality Management District (SCAQMD) jurisdiction. The SCAB is divided geographically into 38 source receptors areas (SRAs), each of which contains an air quality monitoring station excluding SRA 7. The SRA boundaries were drawn based on proximity to the nearest air monitoring station, the local emission inventories, and surrounding topography.

The proposed project is located in SRA 4 (South Los Angeles County Coastal). Ambient concentrations of O_3, PM_{10} and $PM_{2.5}$ exceeded the associated NAAQS and CAAQS numerous times over the three-year period between from 2018 to 2020. The data demonstrate the ongoing challenges that the region faces with regards to improving air quality and bringing the SCAB into attainment of the federal and state standards.

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. The CARB has identified the following groups who are most likely to experience adverse health effects due to exposure to air pollution: children less than 14 years of age, the elderly over 65 years of age, athletes, and people with cardiovascular and chronic respiratory diseases. According to the SCAQMD, land uses that constitute sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. The SCAQMD has established 500 meters or 1,640 feet, as the distance for assessing localized air quality impacts. Sensitive land uses within 500 meters of the project site include various facilities within CSULB (e.g., student housing and athletic facilities), the Veterans Administration Medical Center, Rancho Los Alamitos Historic Ranch and Gardens and single- and multi-family residences.

Significance Thresholds

This Assessment was undertaken to determine whether construction or operation of the proposed project would have the potential to result in significant environmental impacts related to Air Quality in the context of the Appendix G Environmental Checklist criteria of the CEQA Statute and Guidelines. Implementation of the proposed project may result in a significant environmental impact related to Air Quality if the proposed project would:

a) Conflict with or obstruct implementation of the applicable air quality plan;

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard;

c) Expose sensitive receptors to substantial pollutant concentrations; and/or,

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The SCAQMD published a CEQA Air Quality Handbook to guide air quality assessments for CEQA projects within its jurisdiction.[1] SCAQMD methodologies recommend that air pollutant emissions be analyzed in both regional and local contexts. Regional emissions refer to all emissions that would be associated with construction and operation of a project, while localized emissions refer to only those emissions that would be produced by sources located on the project site. To assist in the assessment of air pollutant emissions under impact criteria a), b), and c) above, the SCAQMD established maximum daily threshold values for air pollutant emissions from CEQA projects within the SCAB. The mass daily thresholds were derived using regional emissions modeling techniques to prevent the occurrence of air quality violations that would obstruct implementation of the regional AQMP and hinder efforts to improve regional air quality.

[1] SCAQMD, *CEQA Air Quality Handbook*, 1993.

Table 2 presents the SCAQMD mass daily air quality significance thresholds for regional and localized emissions of regulated pollutants resulting from construction activities.[2] It is anticipated that daily activities would be limited to no more than one acre of site disturbance and the nearest sensitive receptors would be students, faculty, and staff located on the CSULB campus adjacent to the construction site. The localized air quality significance thresholds are specific to SCAQMD SRA 4 for a one-acre construction site with sensitive receptors within 25 meters and were obtained from the SCAQMD LST guidance document.[3,4] The LST values were derived from regionally-specific modeling of pollutant emissions and are designed to prevent localized pollutant concentrations from exceeding applicable ambient air quality standards near construction sites.

TABLE 2: SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS – MASS DAILY EMISSIONS						
Pollutant	**VOC**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
CONSTRUCTION						
Regional Threshold (lbs./day)	75	100	550	150	150	55
Localized Threshold (lbs./day)	--	57	585	--	4	3
OPERATIONS						
Regional Threshold (lbs./day)	55	55	550	150	150	55
Localized Threshold (lbs./day)	--	57	585	--	1	1
lbs./day = pounds per day **SOURCE**: SCAQMD, 2019.						

The 2008 EIR found that construction emissions could exceed SCAQMD thresholds for NO_X and PM_{10} and included several mitigation measures to reduce construction- period air pollutant emissions to a less-than-significant level. The mitigation measures, as listed on Page xix of the 2008 EIR, included:

1. Exposed surfaces are watered as needed
2. Soils stabilizers are applied to disturbed inactive areas as needed.
3. Ground cover is replaced quickly in inactive areas.
4. All stockpiles are covered with tarps or plastic sheeting.
5. All unpaved haul roads are watered daily, and all access points used by haul trucks are kept clean during the site grading.
6. Speed on unpaved roads is reduced to below 15 miles per hour.
7. Trucks carrying contents subject to airborne dispersal are covered.
8. Grading and other high-dust activities cease during high wind conditions (wind speeds exceeding a sustained rate of 25 miles an hour).
9. Diesel particulate filters are installed on diesel equipment and trucks.
10. All construction equipment will be properly tuned.

[2]SCAQMD, *SCAQMD Air Quality Significance Thresholds – Mass Daily Thresholds*, March 2015.
[3]SCAQMD, *Final Localized Significance Threshold Methodology Appendix C Mass Rate Lookup Tables*, October 21, 2009.
[4]SCAQMD, *Fact Sheet for Applying CalEEMod to Localized Significance Thresholds*, 2008.

11. To reduce emissions from idling, the contractor shall ensure that all equipment and vehicles not in use for more than 5 minutes are turned off, whenever feasible.
12. Low VOC-content paint, stucco, or other architectural coatings materials will be utilized to the extent possible.
13. Low VOC-content asphalt and concrete will be utilized to the extent possible.
14. The University will continue to comply with SCAQMD Rule 1403 (Asbestos Emissions from Renovation/Demolition Activities) and other pertinent regulations when working on structures containing asbestos, lead, or other toxic materials.
15. As appropriate, outdoor activities at the campus will be limited during high-dust and other heavy construction activities, including painting.
16. If construction activities occur adjacent to classrooms, student dormitories, health facilities and other sensitive receptors the University will either:
    i. Make findings and notify each sensitive receptor that construction activity will not affect such receptor, or
    ii. Install and maintain filters on interior ventilation system to reduce intake of pollutants until construction activity ceases.

Methodology

Construction emissions are estimated using California Emissions Estimator Model (CalEEMod, Version 2020.4.0). Emission factors applicable to the Los Angeles County portion of the SCAB were used with conservative estimates of equipment activity, worker trips, fugitive dust generation, and material hauling trips to estimate maximum daily emissions during each construction phase. Construction emissions were estimated using detailed equipment inventories and construction scheduling information provided by the engineering team combined with emissions factors from the EMFAC2017 and OFFROAD models. Operational emissions are also estimated using CalEEMod. Permanent sources of emissions include vehicle trips associated with the clinic, landscaping equipment, and natural gas combustion. A transportation analysis completed for the proposed project estimated that the clinic would generate an estimated 564 daily trips. Refer to the attached CalEEMod output files for detailed assumptions related to construction equipment and other emission sources.

Impact Assessment

a) Would the proposed project conflict with or obstruct implementation of the applicable air quality plan? (Less-Than-Significant Impact)

The following analysis addresses the consistency with applicable SCAQMD and SCAG policies, including the SCAQMD's 2016 AQMP and growth projections within the SCAG's 2016–2040 RTP/SCS. The purpose of the consistency finding is to determine if a project is inconsistent with the assumptions and objectives of the regional air quality plans, and thus if it would interfere with the region's ability to comply with federal and state air quality standards on the designated SIP timeline. The consistency determination at the environmental review stage in the planning process plays an essential role in local agency project review by linking local planning to the AQMP. The SCAQMD acknowledges that generally, only new or amended General Plan Elements, Specific Plans, and significant projects need to undergo a comprehensive consistency review. This is because the AQMP control strategy is based on regional and local growth projections from General Plans and metropolitan planning organizations (MPOs, such as SCAG). As such, projects consistent with the local General Plans and underlying regional and local growth projections are considered consistent with the AQMP.

Consistency with the AQMP means that a project is consistent with the goals, objectives, and assumptions in the respective plan to achieve the federal and state ambient air quality standards. In accordance with the procedures established in the SCAQMD's CEQA Air Quality Handbook, the following criteria are required to be addressed in order to determine the consistency with applicable SCAQMD and SCAG policies:

- Would the proposed project result in any of the following?
  - An increase in the frequency or severity of existing air quality violations;
  - Cause or contribute to new air quality violations; or,
  - Delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.
- Would the proposed project exceed the assumptions utilized in preparing the AQMP?
  - Is the project consistent with the population and employment growth projections upon which AQMP forecasted emission levels are based;
  - Does the project include air quality mitigation measures; or,
  - To what extent is project development consistent with the AQMP land use policies?

The first indicator is assessed by comparing emissions of air pollutants that would be produced by construction and operation of the proposed project to the SCAQMD significance thresholds, both on regional and localized scales. The air quality significance thresholds were designed to prevent the occurrence and exacerbation of air quality violations resulting from construction and operation of individual CEQA projects in the context of existing ambient air quality conditions. The second indicator is assessed by determining consistency of permanent operations with population, housing, and employment assumptions that were used in the development of the AQMP and the RTP/SCS.

Construction

Construction of the proposed project has the potential to create air quality impacts through the use of heavy-duty construction equipment and through vehicle trips by construction workers and haul trucks traveling to and from the project site. Fugitive dust emissions would primarily result from site preparation (e.g., demolition and grading) activities. NO_X emissions would predominantly result from the use of construction equipment and haul truck trips. The assessment of construction air quality impacts considers all of these emissions sources. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation and, for dust, the prevailing weather conditions. It is mandatory for all construction projects in the SCAB to comply with SCAQMD Rule 403 for Fugitive Dust. Rule 403 control requirements include measures to prevent the generation of visible dust plumes. Measures include, but are not limited to, applying soil binders to uncovered areas, reestablishing ground cover as quickly as possible, utilizing a wheel washing system or other control measures to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site, and maintaining effective cover over exposed areas. Compliance with the provisions and best management practices propagated by Rule 403—such as the application of water as a dust suppressant to exposed stockpiles and disturbed ground surfaces—would reduce regional fugitive dust PM_{10} and $PM_{2.5}$ emissions associated with construction activities by approximately 61 percent.

Table 3 shows the maximum unmitigated daily emissions for each activity, including emissions from sources located both on- and off-site. As stated above, the unmitigated emissions account for the provisions of SCAQMD Rule 403, which requires best management practice in fugitive dust control resulting in a 61 percent reduction from on-site fugitive dust sources including disturbed ground surface and material stockpiles. Maximum daily emissions of all air pollutants would remain below all applicable regional SCAQMD thresholds during construction of the proposed project, and air quality impacts would be less than significant. The revised project would not result in new or more severe air quality impacts.

TABLE 3: ESTIMATED DAILY CONSTRUCTION EMISSIONS						
	Daily Emissions (Pounds Per Day)					
Phase	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Demolition						
On-Site Emissions	1.5	14.3	13.5	<0.1	0.9	0.7
Off-Site Emissions	0.5	10.1	5.9	<0.1	2.4	0.7
Total	***2.0***	***24.4***	***19.4***	***<0.1***	***3.3***	***1.4***
Site Preparation						
On-Site Emissions	1.1	12.4	6.6	<0.1	3.0	1.6
Off-Site Emissions	0.3	0.3	3.3	<0.1	1.1	0.3
Total	***1.5***	***12.7***	***10.0***	***<0.1***	***4.1***	***1.9***
Grading						
On-Site Emissions	0.9	9.7	5.6	<0.1	2.5	1.4
Off-Site Emissions	0.4	2.7	3.7	<0.1	1.5	0.4
Total	***1.3***	***12.4***	***9.3***	***<0.1***	***4.0***	***1.8***
Trenching						
On-Site Emissions	1.2	10.6	12.9	<0.1	0.6	0.6
Off-Site Emissions	0.3	0.2	3.1	<0.1	1.1	0.3
Total	***1.5***	***10.8***	***16.0***	***<0.1***	***1.8***	***0.9***
Construction + Paving + Architectural Coating						
On-Site Emissions	27.2	19.5	26.6	<0.1	0.8	0.8
Off-Site Emissions	3.2	7.8	31.8	0.1	11.8	3.2
Total	***30.5***	***27.3***	***58.4***	***0.2***	***12.7***	***4.0***
REGIONAL ANALYSIS						
Maximum Regional Daily Emissions	**30.5**	**27.3**	**58.4**	**0.2**	**12.7**	**4.0**
Regional Significance Threshold	75	100	550	150	150	55
Exceed Regional Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
LOCALIZED ANALYSIS						
Maximum Localized Daily Emissions	--	**19.5**	**26.6**	--	**3.0**	**1.6**
Localized Significance Threshold	--	57	585	--	4	3
Exceed Localized Threshold?	**--**	**No**	**No**	**--**	**No**	**No**

Note: Numbers may not add precisely due to rounding.
SOURCE: TAHA, 2021.

Operations

The primary source of operational emissions associated with the proposed project would be vehicle trips associated with the clinic. The proposed project is estimated to generate 564 daily trips from clinic staff, clinic patients, CSULB students, and CSULB employees. Additional long-term area sources of emissions include landscaping equipment and natural gas combustion. **Table 4** shows the emissions modeling completed using CalEEMod demonstrates that pollutant emissions would be less than one pound per day for operational activities. There is no potential for the proposed project to generate permanent pollutant emissions that would exceed SCAQMD thresholds, and air quality impacts would be less than significant. The revised project would not result in new or more severe air quality impacts.

TABLE 4: ESTIMATED DAILY OPERATIONAL EMISSIONS

Source	Daily Emissions (Pounds Per Day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Mobile Sources	**1.4**	**1.4**	**12.9**	**<0.1**	**3.0**	**0.8**
Area Sources	3.1	0.7	0.6	<0.1	<0.1	<0.1
Maximum Regional Daily Emissions	4,5	2.1	13.5	<0,1	3.1	0.9
Regional Significance Threshold	75	100	550	150	150	55
Exceed Regional Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

SOURCE: TAHA, 2022.

The second consistency criterion requires that the proposed project not exceed the assumptions in the AQMP, thereby rendering the regional emissions inventory inaccurate. Implementation of the proposed project would not introduce new housing and related population to CSULB. It is not anticipated that the proposed project would generate new permanent CSULB employment as the proposed project intends to replace an existing building with an updated building to better accommodate existing services. The proposed project would not be considered a significant project by the SCAQMD as it would not affect growth projections incorporated into the ambient air quality standard attainment timelines. The proposed project would not have any potential to result in growth that would exceed the projections incorporated into the AQMP or the 2016–2040 RTP/SCS.

Mitigation Measures

No mitigation measures are required.

b) Would the proposed project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard? (Less-than-Significant Impact)

The SCAB is currently designated nonattainment for O_3, PM_{10}, and $PM_{2.5}$ under the state standards and nonattainment for O_3 and $PM_{2.5}$ under the federal standards. Therefore, a project may result in a cumulatively considerable air quality impact under this criterion if daily emissions of ozone precursors (VOC and NO_X) or particulate matter (PM_{10} and $PM_{2.5}$) exceed applicable air quality thresholds of significance established by the SCAQMD. The SCAQMD designed the significance thresholds to prevent projects from exceeding the ambient air quality standards and potentially resulting in air quality violations. The SCAQMD suggests that if any quantitative air quality significance threshold is exceeded by an individual project during construction activities or operation, that project is considered cumulatively considerable and would be required to implement effective and feasible mitigation measures to reduce air quality impacts.

Conversely, the SCAQMD propagates the guidance that if an individual project would not exceed the regional mass daily thresholds, then it is generally not considered to be cumulatively significant. This method of impact determination allows for the screening of individual projects that would not represent substantial new sources of emissions in the SCAB; it also serves to exclude smaller projects from the responsibility of identifying potentially concurrent new or proposed construction and operation emissions nearby since the incremental contribution to regional emissions is minor. As shown in **Tables 3** and **4**, implementation of the proposed project would not exceed any applicable SCAQMD regional mass daily thresholds during construction or operation. Therefore, the proposed project would not generate cumulatively considerable emissions of ozone precursors or particulate matter and impacts would be less than significant. The revised project would not result in new or more severe air quality impacts.

Mitigation Measures

No mitigation measures are required.

c) Would the proposed project expose sensitive receptors to substantial pollutant concentrations? (Less-than-Significant Impact)

Construction

The use of heavy-duty construction equipment and haul trucks during construction activities would release diesel PM to the atmosphere through exhaust emissions. Diesel PM is a known carcinogen, and extended exposure to elevated concentrations of diesel PM can increase excess cancer risks in individuals. However, carcinogenic risks are typically assessed over timescales of several years to decades, as the carcinogenic dose response is cumulative in nature. Short-term exposures to diesel PM would have to involve extremely high concentrations in order to exceed the SCAQMD air quality significance threshold of 10 excess cancers per million. Over the course of construction activities, average diesel PM emissions from on-site equipment would be approximately 0.44 pounds per day. It is unlikely that diesel PM concentrations would be of any public health concern during the 24-month construction period, and diesel PM emissions would cease upon completion of construction activities. Therefore, the proposed project would result in a less-than-significant impact related to construction toxic air contaminants emissions. The revised project would not result in new or more severe air quality impacts.

Operation

The SCAQMD recommends that a health risk assessment be conducted for substantial sources of diesel PM emissions (e.g., truck stops and distribution facilities). The proposed project is not one that would generate a substantial number of heavy-duty truck trips within the region, such as a distribution warehouse. It is anticipated that the proposed project would generate fewer truck trips than a typical commercial development and no other sources of operational air toxic emissions have been identified at the project site. Therefore, the proposed project would not result in an impact related to operational pollutants. The revised project would not result in new or more severe air quality impacts.

Mitigation Measures

No mitigation measures are required.

d) Would the proposed project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? (Less Than Significant Impact)

Construction

Potential construction emissions other than the sources addressed above include lead paint, asbestos, and odors. The existing buildings to be demolished include lead paint and asbestos. CSULB would comply with SCAQMD Rule 1403 (Asbestos Emissions from Renovation/Demolition Activities) and other pertinent regulations when working on structures containing asbestos, lead, or other toxic materials. Mandatory compliance with these regulations regarding asbestos, and other toxic materials during demolition will ensure a less than significant impact related to the removal of these materials during construction. Potential sources that may produce objectionable odors during construction activities include equipment exhaust, application of asphalt and architectural coatings, and other interior and exterior finishes. Odors from these sources would be localized and generally confined to the immediate area surrounding the project site and would be temporary in nature and would not persist beyond the termination of construction activities. The proposed project would utilize standard construction techniques, and the odors would be typical of most construction sites and temporary in nature. In addition, as construction-related emissions dissipate away from the construction area, the odors associated with these emissions would also decrease and would be quickly diluted. The construction contractor will ensure that activities comply with SCAQMD Rules 401 (Visible Emissions) and 402 (Nuisance) to prevent the occurrence of public nuisances and visible dust plumes traveling off-site. Therefore, the proposed project would result not result in an impact related to construction odors and other nuisances. The revised project would not result in new or more severe air quality impacts.

Operations

Odors are the only potential operational emissions other than the sources addressed above. Land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies and fiberglass molding. The operations would comply with SCAQMD Rule 402, which would prohibit any air quality discharge that would be a nuisance or pose any harm to individuals of the public. Therefore, the proposed project would not result in a significant impact related to operational odors or other nuisances. The revised project would not result in new or more severe air quality impacts.

Mitigation Measures

No mitigation measures are required.

References

California Air Pollution Control Officer's Association, *California Emissions Estimator Model Version 2016.3.2*, September 2016.

South Coast Air Quality Management District, *NAAQS and CAAQS Attainment Status for South Coast Air Basin*, October 2018.

South Coast Air Quality Management District, *CEQA Air Quality Handbook*, 1993.

South Coast Air Quality Management District, *Fact Sheet for Applying CalEEMod to Localized Significance Thresholds*, 2008.

South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology Appendix C Mass Rate Lookup Tables*, October 21, 2009.

South Coast Air Quality Management District, *SCAQMD Air Quality Significance Thresholds*, March 2015.

Southern California Association of Governments, *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy*, April 2016.

United States Environmental Protection Agency, *The Green Book Nonattainment Areas for Criteria Pollutants*, https://www.epa.gov/green-book, October 2019.

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

CSULB Peterson Hall 1 Replacement 2020-100

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Library	137.07	1000sqft	3.15	137,072.00	0
Parking Lot	45.00	Space	0.41	18,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2025
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Construction of new 137,072 gross square feet, three-story building with 45 space parking lot

Construction Phase - Demolition: 2 months, Site Prep: 2 months, Grading: 2 months, Trenching: 2 months, Building Construction: 13 months, Paving 1.5 months, Architectural coating: 2 months

Off-road Equipment - Conservative estimate

Off-road Equipment - From construction data list

Off-road Equipment - From construction data list

Off-road Equipment - Construction data list

Off-road Equipment - From construction data list

Off-road Equipment - From construction data list

Off-road Equipment - From construction data list

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Trips and VMT - From construction data list/PD. Conservative estimates. Haul trips during demo and grading represent the maximum daily trips during phases.

Demolition -

Grading -

Architectural Coating - SCAQMD Rule 1113 = 50g/L for building envelope coatings

Vehicle Trips - Project would generate an estimated 564 daily trips

Area Coating - SCAQMD Rule 1113

Construction Off-road Equipment Mitigation - SCAQMD Rule 403

Mobile Land Use Mitigation -

Area Mitigation - SCAQMD Rule 1113

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	50.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	100	50
tblConstructionPhase	NumDays	18.00	45.00
tblConstructionPhase	NumDays	230.00	280.00
tblConstructionPhase	NumDays	20.00	45.00
tblConstructionPhase	NumDays	8.00	45.00
tblConstructionPhase	NumDays	18.00	35.00
tblConstructionPhase	NumDays	5.00	45.00
tblGrading	MaterialExported	0.00	4,000.00
tblLandUse	LandUseSquareFeet	137,070.00	137,072.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	7.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblTripsAndVMT	HaulingTripNumber	105.00	3,240.00
tblTripsAndVMT	HaulingTripNumber	500.00	800.00
tblTripsAndVMT	VendorTripNumber	25.00	104.00
tblTripsAndVMT	VendorTripNumber	0.00	30.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	WorkerTripNumber	13.00	100.00
tblTripsAndVMT	WorkerTripNumber	8.00	100.00
tblTripsAndVMT	WorkerTripNumber	8.00	100.00
tblTripsAndVMT	WorkerTripNumber	13.00	100.00
tblTripsAndVMT	WorkerTripNumber	65.00	770.00
tblTripsAndVMT	WorkerTripNumber	13.00	100.00
tblTripsAndVMT	WorkerTripNumber	13.00	100.00
tblVehicleTrips	ST_TR	80.09	4.12

tblVehicleTrips	SU_TR	42.09	4.12
tblVehicleTrips	WD_TR	72.05	4.12

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	1.9626	24.3745	19.3306	0.0757	7.3814	0.7428	7.8955	3.3003	0.6958	3.7733	0.0000	7,915.652 6	7,915.652 6	0.8693	0.7602	8,163.934 3
2024	4.0092	16.9471	37.9724	0.1113	9.2730	0.6457	9.7937	3.3003	0.5940	3.7499	0.0000	11,291.56 75	11,291.56 75	0.5918	0.4725	11,446.91 54
2025	25.5215	16.1042	36.2580	0.1085	9.2730	0.4604	9.7333	2.4744	0.4418	2.9161	0.0000	11,078.68 96	11,078.68 96	0.5581	0.4557	11,228.44 11
Maximum	**25.5215**	**24.3745**	**37.9724**	**0.1113**	**9.2730**	**0.7428**	**9.7937**	**3.3003**	**0.6958**	**3.7733**	**0.0000**	**11,291.56 75**	**11,291.56 75**	**0.8693**	**0.7602**	**11,446.91 54**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	1.9626	24.3745	19.3306	0.0757	3.5606	0.7428	4.0747	1.4679	0.6958	1.9409	0.0000	7,915.652 6	7,915.652 6	0.8693	0.7602	8,163.934 3
2024	4.0092	16.9471	37.9724	0.1113	9.2730	0.6457	9.7937	2.4744	0.5940	2.9744	0.0000	11,291.56 75	11,291.56 75	0.5918	0.4725	11,446.91 54
2025	25.5215	16.1042	36.2580	0.1085	9.2730	0.4604	9.7333	2.4744	0.4418	2.9161	0.0000	11,078.68 96	11,078.68 96	0.5581	0.4557	11,228.44 11
Maximum	**25.5215**	**24.3745**	**37.9724**	**0.1113**	**9.2730**	**0.7428**	**9.7937**	**2.4744**	**0.6958**	**2.9744**	**0.0000**	**11,291.56 75**	**11,291.56 75**	**0.8693**	**0.7602**	**11,446.91 54**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	14.74	0.00	13.93	29.29	0.00	24.98	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.0281	1.7000e-004	0.0185	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0399	0.0399	1.0000e-004		0.0424
Energy	0.0727	0.6612	0.5555	3.9700e-003		0.0503	0.0503		0.0503	0.0503		793.4934	793.4934	0.0152	0.0146	798.2087
Mobile	1.3867	1.4034	12.8831	0.0268	3.0020	0.0203	3.0223	0.7997	0.0189	0.8185		2,806.4507	2,806.4507	0.2057	0.1262	2,849.2049
Total	**4.4875**	**2.0648**	**13.4571**	**0.0308**	**3.0020**	**0.0706**	**3.0726**	**0.7997**	**0.0692**	**0.8689**		**3,599.9839**	**3,599.9839**	**0.2210**	**0.1408**	**3,647.4560**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.0281	1.7000e-004	0.0185	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0399	0.0399	1.0000e-004		0.0424
Energy	0.0727	0.6612	0.5555	3.9700e-003		0.0503	0.0503		0.0503	0.0503		793.4934	793.4934	0.0152	0.0146	798.2087
Mobile	1.3867	1.4034	12.8831	0.0268	3.0020	0.0203	3.0223	0.7997	0.0189	0.8185		2,806.4507	2,806.4507	0.2057	0.1262	2,849.2049
Total	**4.4875**	**2.0648**	**13.4571**	**0.0308**	**3.0020**	**0.0706**	**3.0726**	**0.7997**	**0.0692**	**0.8689**		**3,599.9839**	**3,599.9839**	**0.2210**	**0.1408**	**3,647.4560**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/4/2023	11/3/2023	5	45	
2	Site Preparation	Site Preparation	11/6/2023	1/5/2024	5	45	
3	Grading	Grading	1/8/2024	3/8/2024	5	45	
4	Trenching	Trenching	3/11/2024	5/10/2024	5	45	
5	Building Construction	Building Construction	5/13/2024	6/6/2025	5	280	
6	Paving	Paving	6/9/2025	7/25/2025	5	35	
7	Architectural Coating	Architectural Coating	7/28/2025	9/26/2025	5	45	

Acres of Grading (Site Preparation Phase): 42.19

Acres of Grading (Grading Phase): 33.75

Acres of Paving: 0.41

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 205,608; Non-Residential Outdoor: 68,536; Striped Parking Area: 1,080 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41

Site Preparation	Rubber Tired Dozers		1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes		1	8.00	97	0.37
Grading	Graders		1	6.00	187	0.41
Grading	Rubber Tired Dozers		1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes		1	7.00	97	0.37
Trenching	Excavators		1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes		2	8.00	97	0.37
Trenching	Trenchers		2	8.00	78	0.50
Building Construction	Cranes		1	6.00	231	0.29
Building Construction	Forklifts		1	6.00	89	0.20
Building Construction	Generator Sets		1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes		1	6.00	97	0.37
Building Construction	Welders		3	8.00	46	0.45
Paving	Cement and Mortar Mixers		1	6.00	9	0.56
Paving	Pavers		1	6.00	130	0.42
Paving	Paving Equipment		1	8.00	132	0.36
Paving	Rollers		1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes		1	8.00	97	0.37
Architectural Coating	Aerial Lifts		2	6.00	63	0.31
Architectural Coating	Air Compressors		2	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	100.00	0.00	3,240.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	100.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	100.00	0.00	800.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	5	100.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

Building Construction	7	770.00	104.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	100.00	30.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	4	100.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5041	0.0000	0.5041	0.0763	0.0000	0.0763			0.0000			0.0000
Off-Road	1.4725	14.3184	13.4577	0.0241		0.6766	0.6766		0.6328	0.6328		2,324.395 9	2,324.395 9	0.5893		2,339.127 8
Total	**1.4725**	**14.3184**	**13.4577**	**0.0241**	**0.5041**	**0.6766**	**1.1807**	**0.0763**	**0.6328**	**0.7091**		**2,324.395 9**	**2,324.395 9**	**0.5893**		**2,339.127 8**

3.2 Demolition - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Hauling	0.1461	9.8095	2.5421	0.0422	1.2603	0.0594	1.3197	0.3455	0.0569	0.4024		4,632.030 0	4,632.030 0	0.2545	0.7356	4,857.594 3
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
Worker	0.3441	0.2466	3.3308	9.3700e-003	1.1178	6.7400e-003	1.1245	0.2964	6.2100e-003	0.3027		959.2267	959.2267	0.0256	0.0247	967.2121
Total	**0.4901**	**10.0561**	**5.8729**	**0.0515**	**2.3781**	**0.0662**	**2.4442**	**0.6420**	**0.0631**	**0.7050**		**5,591.256 7**	**5,591.256 7**	**0.2800**	**0.7602**	**5,824.806 5**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day								lb/day			
Fugitive Dust					0.1966	0.0000	0.1966	0.0298	0.0000	0.0298			0.0000			0.0000
Off-Road	1.4725	14.3184	13.4577	0.0241		0.6766	0.6766		0.6328	0.6328	0.0000	2,324.395 9	2,324.395 9	0.5893		2,339.127 8
Total	**1.4725**	**14.3184**	**13.4577**	**0.0241**	**0.1966**	**0.6766**	**0.8732**	**0.0298**	**0.6328**	**0.6625**	**0.0000**	**2,324.395 9**	**2,324.395 9**	**0.5893**		**2,339.127 8**

3.2 Demolition - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1461	9.8095	2.5421	0.0422	1.2603	0.0594	1.3197	0.3455	0.0569	0.4024		4,632.030 0	4,632.030 0	0.2545	0.7356	4,857.594 3
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
Worker	0.3441	0.2466	3.3308	9.3700e-003	1.1178	6.7400e-003	1.1245	0.2964	6.2100e-003	0.3027		959.2267	959.2267	0.0256	0.0247	967.2121
Total	**0.4901**	**10.0561**	**5.8729**	**0.0515**	**2.3781**	**0.0662**	**2.4442**	**0.6420**	**0.0631**	**0.7050**		**5,591.256 7**	**5,591.256 7**	**0.2800**	**0.7602**	**5,824.806 5**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2636	0.0000	6.2636	3.0038	0.0000	3.0038			0.0000			0.0000
Off-Road	1.1339	12.4250	6.6420	0.0172		0.5074	0.5074		0.4668	0.4668		1,666.057 3	1,666.057 3	0.5388		1,679.528 2
Total	**1.1339**	**12.4250**	**6.6420**	**0.0172**	**6.2636**	**0.5074**	**6.7710**	**3.0038**	**0.4668**	**3.4706**		**1,666.057 3**	**1,666.057 3**	**0.5388**		**1,679.528 2**

3.3 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker	0.3441	0.2466	3.3308	9.3700e-003	1.1178	6.7400e-003	1.1245	0.2964	6.2100e-003	0.3027		959.2267	959.2267	0.0256	0.0247	967.2121
Total	**0.3441**	**0.2466**	**3.3308**	**9.3700e-003**	**1.1178**	**6.7400e-003**	**1.1245**	**0.2964**	**6.2100e-003**	**0.3027**		**959.2267**	**959.2267**	**0.0256**	**0.0247**	**967.2121**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4428	0.0000	2.4428	1.1715	0.0000	1.1715			0.0000			0.0000
Off-Road	1.1339	12.4250	6.6420	0.0172		0.5074	0.5074		0.4668	0.4668	0.0000	1,666.0573	1,666.0573	0.5388		1,679.5282
Total	**1.1339**	**12.4250**	**6.6420**	**0.0172**	**2.4428**	**0.5074**	**2.9502**	**1.1715**	**0.4668**	**1.6383**	**0.0000**	**1,666.0573**	**1,666.0573**	**0.5388**		**1,679.5282**

3.3 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker	0.3441	0.2466	3.3308	9.3700e-003	1.1178	6.7400e-003	1.1245	0.2964	6.2100e-003	0.3027		959.2267	959.2267	0.0256	0.0247	967.2121
Total	**0.3441**	**0.2466**	**3.3308**	**9.3700e-003**	**1.1178**	**6.7400e-003**	**1.1245**	**0.2964**	**6.2100e-003**	**0.3027**		**959.2267**	**959.2267**	**0.0256**	**0.0247**	**967.2121**

3.3 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2636	0.0000	6.2636	3.0038	0.0000	3.0038			0.0000			0.0000
Off-Road	1.1067	11.8407	6.6317	0.0172		0.4823	0.4823		0.4437	0.4437		1,665.8826	1,665.8826	0.5388		1,679.3521
Total	**1.1067**	**11.8407**	**6.6317**	**0.0172**	**6.2636**	**0.4823**	**6.7459**	**3.0038**	**0.4437**	**3.4475**		**1,665.8826**	**1,665.8826**	**0.5388**		**1,679.3521**

3.3 Site Preparation - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker	0.3217	0.2202	3.1031	9.1100e-003	1.1178	6.4700e-003	1.1242	0.2964	5.9500e-003	0.3024		939.5399	939.5399	0.0232	0.0229	946.9482
Total	**0.3217**	**0.2202**	**3.1031**	**9.1100e-003**	**1.1178**	**6.4700e-003**	**1.1242**	**0.2964**	**5.9500e-003**	**0.3024**		**939.5399**	**939.5399**	**0.0232**	**0.0229**	**946.9482**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4428	0.0000	2.4428	1.1715	0.0000	1.1715			0.0000			0.0000
Off-Road	1.1067	11.8407	6.6317	0.0172		0.4823	0.4823		0.4437	0.4437	0.0000	1,665.8826	1,665.8826	0.5388		1,679.3521
Total	**1.1067**	**11.8407**	**6.6317**	**0.0172**	**2.4428**	**0.4823**	**2.9251**	**1.1715**	**0.4437**	**1.6152**	**0.0000**	**1,665.8826**	**1,665.8826**	**0.5388**		**1,679.3521**

3.3 Site Preparation - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker	0.3217	0.2202	3.1031	9.1100e-003	1.1178	6.4700e-003	1.1242	0.2964	5.9500e-003	0.3024		939.5399	939.5399	0.0232	0.0229	946.9482
Total	**0.3217**	**0.2202**	**3.1031**	**9.1100e-003**	**1.1178**	**6.4700e-003**	**1.1242**	**0.2964**	**5.9500e-003**	**0.3024**		**939.5399**	**939.5399**	**0.0232**	**0.0229**	**946.9482**

3.4 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.3220	0.0000	5.3220	2.5701	0.0000	2.5701			0.0000			0.0000
Off-Road	0.9132	9.7297	5.5468	0.0141		0.4001	0.4001		0.3681	0.3681		1,364.6623	1,364.6623	0.4414		1,375.6962
Total	**0.9132**	**9.7297**	**5.5468**	**0.0141**	**5.3220**	**0.4001**	**5.7221**	**2.5701**	**0.3681**	**2.9382**		**1,364.6623**	**1,364.6623**	**0.4414**		**1,375.6962**

3.4 Grading - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0358	2.4284	0.6386	0.0103	0.3112	0.0148	0.3260	0.0853	0.0142	0.0995		1,127.531 5	1,127.531 5	0.0634	0.1791	1,182.495 0
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
Worker	0.3217	0.2202	3.1031	9.1100e-003	1.1178	6.4700e-003	1.1242	0.2964	5.9500e-003	0.3024		939.5399	939.5399	0.0232	0.0229	946.9482
Total	**0.3576**	**2.6486**	**3.7416**	**0.0194**	**1.4290**	**0.0213**	**1.4502**	**0.3818**	**0.0201**	**0.4019**		**2,067.071 4**	**2,067.071 4**	**0.0866**	**0.2020**	**2,129.443 1**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.0756	0.0000	2.0756	1.0023	0.0000	1.0023			0.0000			0.0000
Off-Road	0.9132	9.7297	5.5468	0.0141		0.4001	0.4001		0.3681	0.3681	0.0000	1,364.662 3	1,364.662 3	0.4414		1,375.696 2
Total	**0.9132**	**9.7297**	**5.5468**	**0.0141**	**2.0756**	**0.4001**	**2.4757**	**1.0023**	**0.3681**	**1.3704**	**0.0000**	**1,364.662 3**	**1,364.662 3**	**0.4414**		**1,375.696 2**

3.4 Grading - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0358	2.4284	0.6386	0.0103	0.3112	0.0148	0.3260	0.0853	0.0142	0.0995		1,127.5315	1,127.5315	0.0634	0.1791	1,182.4950
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
Worker	0.3217	0.2202	3.1031	9.1100e-003	1.1178	6.4700e-003	1.1242	0.2964	5.9500e-003	0.3024		939.5399	939.5399	0.0232	0.0229	946.9482
Total	**0.3576**	**2.6486**	**3.7416**	**0.0194**	**1.4290**	**0.0213**	**1.4502**	**0.3818**	**0.0201**	**0.4019**		**2,067.0714**	**2,067.0714**	**0.0866**	**0.2020**	**2,129.4431**

3.5 Trenching - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1481	10.6181	12.9206	0.0182		0.6392	0.6392		0.5881	0.5881		1,758.1190	1,758.1190	0.5686		1,772.3342
Total	**1.1481**	**10.6181**	**12.9206**	**0.0182**		**0.6392**	**0.6392**		**0.5881**	**0.5881**		**1,758.1190**	**1,758.1190**	**0.5686**		**1,772.3342**

3.5 Trenching - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker	0.3217	0.2202	3.1031	9.1100e-003	1.1178	6.4700e-003	1.1242	0.2964	5.9500e-003	0.3024		939.5399	939.5399	0.0232	0.0229	946.9482
Total	**0.3217**	**0.2202**	**3.1031**	**9.1100e-003**	**1.1178**	**6.4700e-003**	**1.1242**	**0.2964**	**5.9500e-003**	**0.3024**		**939.5399**	**939.5399**	**0.0232**	**0.0229**	**946.9482**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1481	10.6181	12.9206	0.0182		0.6392	0.6392		0.5881	0.5881	0.0000	1,758.1190	1,758.1190	0.5686		1,772.3342
Total	**1.1481**	**10.6181**	**12.9206**	**0.0182**		**0.6392**	**0.6392**		**0.5881**	**0.5881**	**0.0000**	**1,758.1190**	**1,758.1190**	**0.5686**		**1,772.3342**

3.5 Trenching - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker	0.3217	0.2202	3.1031	9.1100e-003	1.1178	6.4700e-003	1.1242	0.2964	5.9500e-003	0.3024		939.5399	939.5399	0.0232	0.0229	946.9482
Total	**0.3217**	**0.2202**	**3.1031**	**9.1100e-003**	**1.1178**	**6.4700e-003**	**1.1242**	**0.2964**	**5.9500e-003**	**0.3024**		**939.5399**	**939.5399**	**0.0232**	**0.0229**	**946.9482**

3.6 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4200	11.0639	12.5172	0.0221		0.4506	0.4506		0.4348	0.4348		2,001.9214	2,001.9214	0.3334		2,010.2563
Total	**1.4200**	**11.0639**	**12.5172**	**0.0221**		**0.4506**	**0.4506**		**0.4348**	**0.4348**		**2,001.9214**	**2,001.9214**	**0.3334**		**2,010.2563**

3.6 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1118	4.1880	1.5616	0.0191	0.6662	0.0203	0.6865	0.1918	0.0194	0.2113		2,055.189 1	2,055.189 1	0.0697	0.2961	2,145.158 4
Worker	2.4774	1.6953	23.8937	0.0701	8.6068	0.0498	8.6566	2.2826	0.0459	2.3284		7,234.457 0	7,234.457 0	0.1783	0.1765	7,291.500 8
Total	**2.5892**	**5.8833**	**25.4553**	**0.0892**	**9.2730**	**0.0701**	**9.3431**	**2.4744**	**0.0653**	**2.5397**		**9,289.646 1**	**9,289.646 1**	**0.2480**	**0.4725**	**9,436.659 2**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4200	11.0639	12.5172	0.0221		0.4506	0.4506		0.4348	0.4348	0.0000	2,001.921 4	2,001.921 4	0.3334		2,010.256 3
Total	**1.4200**	**11.0639**	**12.5172**	**0.0221**		**0.4506**	**0.4506**		**0.4348**	**0.4348**	**0.0000**	**2,001.921 4**	**2,001.921 4**	**0.3334**		**2,010.256 3**

3.6 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1118	4.1880	1.5616	0.0191	0.6662	0.0203	0.6865	0.1918	0.0194	0.2113		2,055.1891	2,055.1891	0.0697	0.2961	2,145.1584
Worker	2.4774	1.6953	23.8937	0.0701	8.6068	0.0498	8.6566	2.2826	0.0459	2.3284		7,234.4570	7,234.4570	0.1783	0.1765	7,291.5008
Total	**2.5892**	**5.8833**	**25.4553**	**0.0892**	**9.2730**	**0.0701**	**9.3431**	**2.4744**	**0.0653**	**2.5397**		**9,289.6461**	**9,289.6461**	**0.2480**	**0.4725**	**9,436.6592**

3.6 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3246	10.4128	12.4393	0.0221		0.3925	0.3925		0.3785	0.3785		2,002.1524	2,002.1524	0.3269		2,010.3248
Total	**1.3246**	**10.4128**	**12.4393**	**0.0221**		**0.3925**	**0.3925**		**0.3785**	**0.3785**		**2,002.1524**	**2,002.1524**	**0.3269**		**2,010.3248**

3.6 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1084	4.1685	1.5333	0.0187	0.6662	0.0204	0.6866	0.1918	0.0195	0.2113		2,018.249 8	2,018.249 8	0.0702	0.2909	2,106.702 4
Worker	2.3249	1.5229	22.2854	0.0678	8.6068	0.0475	8.6543	2.2826	0.0437	2.3263		7,058.287 3	7,058.287 3	0.1610	0.1648	7,111.413 9
Total	**2.4332**	**5.6914**	**23.8187**	**0.0865**	**9.2730**	**0.0679**	**9.3409**	**2.4744**	**0.0632**	**2.5376**		**9,076.537 1**	**9,076.537 1**	**0.2312**	**0.4557**	**9,218.116 4**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3246	10.4128	12.4393	0.0221		0.3925	0.3925		0.3785	0.3785	0.0000	2,002.152 4	2,002.152 4	0.3269		2,010.324 8
Total	**1.3246**	**10.4128**	**12.4393**	**0.0221**		**0.3925**	**0.3925**		**0.3785**	**0.3785**	**0.0000**	**2,002.152 4**	**2,002.152 4**	**0.3269**		**2,010.324 8**

3.6 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1084	4.1685	1.5333	0.0187	0.6662	0.0204	0.6866	0.1918	0.0195	0.2113		2,018.249 8	2,018.249 8	0.0702	0.2909	2,106.702 4
Worker	2.3249	1.5229	22.2854	0.0678	8.6068	0.0475	8.6543	2.2826	0.0437	2.3263		7,058.287 3	7,058.287 3	0.1610	0.1648	7,111.413 9
Total	**2.4332**	**5.6914**	**23.8187**	**0.0865**	**9.2730**	**0.0679**	**9.3409**	**2.4744**	**0.0632**	**2.5376**		**9,076.537 1**	**9,076.537 1**	**0.2312**	**0.4557**	**9,218.116 4**

3.7 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5732	5.3259	8.7951	0.0136		0.2465	0.2465		0.2276	0.2276		1,297.809 6	1,297.809 6	0.4114		1,308.095 1
Paving	0.0307					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6039**	**5.3259**	**8.7951**	**0.0136**		**0.2465**	**0.2465**		**0.2276**	**0.2276**		**1,297.809 6**	**1,297.809 6**	**0.4114**		**1,308.095 1**

3.7 Paving - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0313	1.2024	0.4423	5.4000e-003	0.1922	5.8800e-003	0.1981	0.0553	5.6200e-003	0.0610		582.1875	582.1875	0.0203	0.0839	607.7026
Worker	0.3019	0.1978	2.8942	8.8000e-003	1.1178	6.1700e-003	1.1239	0.2964	5.6800e-003	0.3021		916.6607	916.6607	0.0209	0.0214	923.5603
Total	**0.3332**	**1.4002**	**3.3365**	**0.0142**	**1.3099**	**0.0121**	**1.3220**	**0.3518**	**0.0113**	**0.3631**		**1,498.848 1**	**1,498.848 1**	**0.0412**	**0.1053**	**1,531.262 9**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5732	5.3259	8.7951	0.0136		0.2465	0.2465		0.2276	0.2276	0.0000	1,297.809 6	1,297.809 6	0.4114		1,308.095 1
Paving	0.0307					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6039**	**5.3259**	**8.7951**	**0.0136**		**0.2465**	**0.2465**		**0.2276**	**0.2276**	**0.0000**	**1,297.809 6**	**1,297.809 6**	**0.4114**		**1,308.095 1**

3.7 Paving - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0313	1.2024	0.4423	5.4000e-003	0.1922	5.8800e-003	0.1981	0.0553	5.6200e-003	0.0610		582.1875	582.1875	0.0203	0.0839	607.7026
Worker	0.3019	0.1978	2.8942	8.8000e-003	1.1178	6.1700e-003	1.1239	0.2964	5.6800e-003	0.3021		916.6607	916.6607	0.0209	0.0214	923.5603
Total	**0.3332**	**1.4002**	**3.3365**	**0.0142**	**1.3099**	**0.0121**	**1.3220**	**0.3518**	**0.0113**	**0.3631**		**1,498.8481**	**1,498.8481**	**0.0412**	**0.1053**	**1,531.2629**

3.8 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	24.8185					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3928	3.0716	5.2548	8.4600e-003		0.1164	0.1164		0.1153	0.1153		806.8259	806.8259	0.1096		809.5658
Total	**25.2112**	**3.0716**	**5.2548**	**8.4600e-003**		**0.1164**	**0.1164**		**0.1153**	**0.1153**		**806.8259**	**806.8259**	**0.1096**		**809.5658**

3.8 Architectural Coating - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.3400e-003	0.3207	0.1179	1.4400e-003	0.0512	1.5700e-003	0.0528	0.0148	1.5000e-003	0.0163		155.2500	155.2500	5.4000e-003	0.0224	162.0540
Worker	0.3019	0.1978	2.8942	8.8000e-003	1.1178	6.1700e-003	1.1239	0.2964	5.6800e-003	0.3021		916.6607	916.6607	0.0209	0.0214	923.5603
Total	**0.3103**	**0.5184**	**3.0122**	**0.0102**	**1.1690**	**7.7400e-003**	**1.1768**	**0.3112**	**7.1800e-003**	**0.3184**		**1,071.9107**	**1,071.9107**	**0.0263**	**0.0438**	**1,085.6143**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	24.8185					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3928	3.0716	5.2548	8.4600e-003		0.1164	0.1164		0.1153	0.1153	0.0000	806.8259	806.8259	0.1096		809.5658
Total	**25.2112**	**3.0716**	**5.2548**	**8.4600e-003**		**0.1164**	**0.1164**		**0.1153**	**0.1153**	**0.0000**	**806.8259**	**806.8259**	**0.1096**		**809.5658**

3.8 Architectural Coating - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.3400e-003	0.3207	0.1179	1.4400e-003	0.0512	1.5700e-003	0.0528	0.0148	1.5000e-003	0.0163		155.2500	155.2500	5.4000e-003	0.0224	162.0540
Worker	0.3019	0.1978	2.8942	8.8000e-003	1.1178	6.1700e-003	1.1239	0.2964	5.6800e-003	0.3021		916.6607	916.6607	0.0209	0.0214	923.5603
Total	**0.3103**	**0.5184**	**3.0122**	**0.0102**	**1.1690**	**7.7400e-003**	**1.1768**	**0.3112**	**7.1800e-003**	**0.3184**		**1,071.9107**	**1,071.9107**	**0.0263**	**0.0438**	**1,085.6143**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.3867	1.4034	12.8831	0.0268	3.0020	0.0203	3.0223	0.7997	0.0189	0.8185		2,806.4507	2,806.4507	0.2057	0.1262	2,849.2049
Unmitigated	1.3867	1.4034	12.8831	0.0268	3.0020	0.0203	3.0223	0.7997	0.0189	0.8185		2,806.4507	2,806.4507	0.2057	0.1262	2,849.2049

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Library	564.73	564.73	564.73	1,425,762	1,425,762
Parking Lot	0.00	0.00	0.00		
Total	564.73	564.73	564.73	1,425,762	1,425,762

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Library	16.60	8.40	6.90	52.00	43.00	5.00	44	44	12
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Library	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335
Parking Lot	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0727	0.6612	0.5555	3.9700e-003		0.0503	0.0503		0.0503	0.0503		793.4934	793.4934	0.0152	0.0146	798.2087
NaturalGas Unmitigated	0.0727	0.6612	0.5555	3.9700e-003		0.0503	0.0503		0.0503	0.0503		793.4934	793.4934	0.0152	0.0146	798.2087

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Library	6744.69	0.0727	0.6612	0.5555	3.9700e-003		0.0503	0.0503		0.0503	0.0503		793.4934	793.4934	0.0152	0.0146	798.2087
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0727**	**0.6612**	**0.5555**	**3.9700e-003**		**0.0503**	**0.0503**		**0.0503**	**0.0503**		**793.4934**	**793.4934**	**0.0152**	**0.0146**	**798.2087**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Library	6.74469	0.0727	0.6612	0.5555	3.9700e-003		0.0503	0.0503		0.0503	0.0503		793.4934	793.4934	0.0152	0.0146	798.2087
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0727**	**0.6612**	**0.5555**	**3.9700e-003**		**0.0503**	**0.0503**		**0.0503**	**0.0503**		**793.4934**	**793.4934**	**0.0152**	**0.0146**	**798.2087**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.0281	1.7000e-004	0.0185	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0399	0.0399	1.0000e-004		0.0424
Unmitigated	3.0281	1.7000e-004	0.0185	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0399	0.0399	1.0000e-004		0.0424

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3060					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.7204					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.7100e-003	1.7000e-004	0.0185	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0399	0.0399	1.0000e-004		0.0424
Total	**3.0281**	**1.7000e-004**	**0.0185**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0399**	**0.0399**	**1.0000e-004**		**0.0424**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3060					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.7204					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.7100e-003	1.7000e-004	0.0185	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0399	0.0399	1.0000e-004		0.0424
Total	**3.0281**	**1.7000e-004**	**0.0185**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0399**	**0.0399**	**1.0000e-004**		**0.0424**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B1

Historical Resources Eligibility Assessment

Architectural Resources Group

360 E. 2nd Street, Suite 225
Los Angeles, California 90012

arg-la.com

Memorandum

To	Melissa Soto, MURP Program Planner, Capital Construction Design and Construction Services California State University, Long Beach 1250 Bellflower Blvd., Long Beach, CA 90840
Subject:	Peterson Hall 1 – Eligibility Assessment
Project No.:	190626
Date:	April 8, 2022
Via:	E-mail

Dear Ms. Soto:

At your request, Architectural Resources Group, Inc. (ARG) has assessed the potential eligibility of Peterson Hall 1, a science classroom building on the campus of California State University, Long Beach (CSULB) that is slated for demolition. It is our professional opinion that the building does not meet eligibility criteria for listing in the National Register of Historic Places and/or the California Register of Historical Resources.[1] It is therefore not a "historical resource" for purposes of the California Environmental Quality Act (CEQA). This finding is consistent with the findings of a campus-wide historic resources survey for CSULB that was completed in 2019, which did not identify the subject building as an eligible historical resource. Our findings are summarized in this memorandum and on the appended Department of Parks and Recreation (DPR) 523 series form.

Building Description

Peterson Hall 1 (PH1) is located within the Upper Campus zone of the CSULB campus and was built in 1959. Like many of the early buildings on the CSULB campus it was designed by the California State Division of Architecture and exhibits elements of the Mid-Century Modern style.

The building is two stories tall and is constructed of reinforced concrete. It is generally rectangular in plan, though there is an irregular, single-story lecture hall volume projecting from its south façade. The building is capped by a flat roof with shallow eaves; exterior walls are clad in

[1] The City of Long Beach administers a local designation program with its own set of criteria; however, as it is an entity of the State of California, CSULB is not subject to local land use controls.

painted concrete and Roman brick. Entrances are located at the ends of the building and consist of paired, glazed metal doors with sidelights and transoms. There are also multiple entrances to the lecture hall, which consist of solid metal doors and are set within a sheltered breezeway with squared metal post supports. The north and south façades are extensively fenestrated with continuous ribbons of fixed and awning metal windows. Decorative details are limited to signage.

The building has been minimally altered. Noted alterations include the replacement of original entrance doors.

Background

Peterson Hall 1 was constructed in 1959 as a classroom building for academic departments related to the natural and biological sciences. Originally known as the "Science Building Addition," it was part of a single unit comprising three adjacent science-related classroom buildings: the original Science Building (later Peterson Hall 2, now the Student Success Center) was constructed in 1955, the Science Building Addition (now Peterson Hall 1) was constructed in 1959, and the Science Hall Addition No. 3 (later Peterson Hall 3, since demolished) was constructed in 1963. All of these buildings were designed by the California State Division of Architecture in the Mid-Century Modern style and complemented one another with respect to style, scale, orientation, and use. Together they formed the nucleus of the campus's science-based academic programs.

In recent years this unit of science buildings has been altered. In 2008, Peterson Hall 3 was demolished and replaced with the present-day Hall of Science Building (completed 2011). In 2019, Peterson Hall 2 was extensively remodeled into what is now known as the Student Success Center. Both the Hall of Science Building and the Student Success Center are designed in contemporary idioms that deviate from the Mid-Century Modern aesthetic that defined CSULB's early campus buildings. Peterson Hall 1 thus reads as a remnant of what was once a larger whole.

In 2019, a campus-wide historic resources survey was completed to identify resources of architectural, cultural, and historical significance on the CSULB campus. The survey evaluated all elements of the campus's built environment constructed through the year 1980. Two historic districts and four individual buildings were identified in the survey as appearing eligible for listing in the National Register of Historic Places and/or the California Register of Historical Resources. Given its 1959 construction date, Peterson Hall 1 was evaluated in the 2019 survey but was not found to be eligible for listing, either individually or as an element of a potential historic district.

Summary of Eligibility

Peterson Hall 1 does not appear eligible for listing in the National Register of Historic Places and/or the California Register of Historical Resources, either individually or as part of a historic district. Following is a summary of how this determination was made.

Individual Eligibility

Peterson Hall 1 is not individually eligible for listing in the National Register or California Register. It was built in 1959, at the apex of the CSULB campus's formative period of growth; however, when removed from its environs and evaluated on its own merits the building does not, in and of itself, convey patterns of campus planning and development in a particularly meaningful way. Rooted in principles of campus master planning, significant patterns of early development at CSULB are best expressed as historic districts, as it is the synergy and interrelationship between its buildings and site/landscape features – and not the presence of any one particular building or feature – that conveys a visual sense of the overall historic environment from this period. In addition, there is insufficient evidence demonstrating that the building was the site of a singular event that is shown to be significant to history. The building is not associated with significant events or patterns of events and thus does not satisfy National/California Register Criterion A/1.

Peterson Hall 1 has been used by generations of students, faculty, staff, and others since its original construction in 1959. However, this is a common characteristic of university buildings – and especially classrooms – which, by their nature, are intended to be occupied by a variety of people. It is not a quality that is unique to this particular building. There is insufficient evidence linking the productive life of a significant individual to Peterson Hall 1. Absent any such evidence, there is no basis to conclude that the building is associated with the lives of persons significant to our past. The building does not satisfy National /California Register Criterion B/2.

Peterson Hall 1 is designed in an institutional derivative of the Mid-Century Modern style that was applied to buildings across the CSULB campus to provide the campus with a sense of uniformity and cohesion in its formative years. Thus, the building shares common characteristics with other campus buildings dating to the same general period of development. However, when evaluated separate and apart from its environs and on its own merits, the building does not stand out as a strong architectural statement. It exhibits some characteristics of the Mid-Century Modern style, but lacks the degree of articulation that would be needed to justify architectural significance. As a typical institutional building that lacks architectural gravitas, it does not possess high artistic values, and there is nothing particularly notable about its type, period, or method of construction. The California State Division of Architecture – the building's architect of record – is an agent of state bureaucracy that was charged with designing public buildings efficiently and is not considered to be a master architect. For these reasons the building does not satisfy National/California Register Criterion C/3.

As an archaeological assessment was not conducted as part of this study, the building's potential for containing subsurface archaeological resources is unknown. It was not evaluated against National/California Register Criterion D/4.

Historic District Eligibility

Peterson Hall 1 is adjacent to the Upper Campus Historic District. The district was identified as eligible for listing in the National/California Register in a campus-wide historic resources survey that was completed in 2019. The district is eligible under Criterion A/1 for its association with campus master planning; and under Criterion C/3 as a notable, intact concentration of Mid-Century Modern style institutional architecture and as the work of multiple masters including Gibbs and Gibbs, Killingsworth-Brady and Associates, and Edward Lovell. The district contains 28 buildings (24 contributing) and has a period of significance of 1953-1972.

In spite of its adjacency to the Upper Campus Historic District, Peterson Hall 1 does not contribute to the district due to extensive alterations to its setting. The building was designed as part of a unit composed of three adjacent science-oriented buildings: the original Science Building (later Peterson Hall 2, and now the Student Success Center) was built in 1955; the Science Hall Addition (now Peterson Hall 1) was built in 1959 as the second unit; and the Science Hall Addition No. 3 (later Peterson Hall) was built in 1961. All were designed by the State Division of Architecture in a similar iteration of the Mid-Century Modern style, and all were intended to complement one another in terms of design and function. Together they formed the nucleus of the campus's science-based instruction. However, of these three complementary buildings only Peterson Hall 1 remains. Peterson Hall 3 was demolished in 2008 and subsequently replaced with a new building (Hall of Science, completed 2011); Peterson Hall 2 was extensively remodeled in 2019 and is now known as the Student Success Center. Both the Hall of Science and Student Success Center present as contemporary additions to the CSULB campus and fall well outside the original, Mid-Century Modern aesthetic that defined the campus in its initial period of development. As a result, Peterson Hall 1 – while still standing – is now a fragment of what was once a cohesive whole.

National Register Bulletin 16A: How to Complete the National Register Registration Form provides guidance on how to select appropriate district boundaries. It states that one of the factors to taken into consideration when selecting a boundary involves "visual changes in the character of the area due to different architectural styles, types or periods, or to a decline in the concentration of contributing resources." The modifications that have been made to the science building complex has resulted in visual changes to the aesthetic character of this complex of buildings and has compromised the ability of this complex of buildings to meaningfully converse with other buildings within the Upper Campus Historic District, which are unified by their visual cohesion and shared sense of time and place. For this reason Peterson Hall 1 does not contribute to the significance of the Upper Campus Historic District.

Conclusion

In summary, ARG concludes that Peterson Hall 1 does not satisfy eligibility criteria for listing in the National Register of Historic Places and/or the California Register of Historical Resources. Therefore, the building is not considered to be a "historical resource" for purposes of CEQA.

State of California--- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI
Trinomial #
NRHP Status Code 6Z
Other Listings
Review Code Reviewer Date

*Resource Name or # (Assigned by recorder) Peterson Hall 1 (PH1)

P1. Other Identifier: Science Building Addition; Science 1 (historic names)

***P2. Location:** ☐ Not for Publication ☒ Unrestricted ***a. County** Los Angeles

and (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Date T ;R ; ¼of ¼ of Sec ; B.M.

c. Address 1250 N. Bellflower Boulevard City Long Beach Zip 90840

d. UTM: (Give more than one for large and/or linear resources) Zone ; mE/ mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Peterson Hall 1 (PH1) is located within the Upper Campus area of the CSULB campus (though it is not located within the Upper Campus Historic District). The building is two stories tall and is constructed of concrete. It is mostly rectangular in plan, though there is an irregular lecture hall volume that projects from the south façade. The building was designed by the State Division of Architecture in the Mid-Century Modern style. It is capped by a flat roof with shallow eaves;

Exterior walls are clad in painted concrete and Roman brick. Entrances are located at the ends of the building and consist of paired glazed metal doors with sidelights and transoms. There are also several entrances to the lecture hall volume which consist of solid metal doors, which are elevated and are accessed via a breezeway with squared metal post supports. The north and south façades are extensively glazed with continuous ribbons of fixed and awning metal windows. Decorative details are limited to signage.

Noted alterations include the replacement of original doors.

***P3b. Resource Attributes:** (List attributes and codes) HP15. Educational Building

***P4. Resources Present:** ☒Building ☐Structure ☐ Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.):

*P5a. Photograph or Drawing (Photograph required for buildings, structures or objects)

P5b. Description of Photo: (view, date, accession #) Peterson Hall 1/ PH1, view northeast (ARG, 2019)

***P6. Date Constructed/Age and Sources:** ☒Historic ☐Prehistoric ☐Both
1959 (CSULB Office of Physical Planning and Sustainability)

***P7. Owner and Address:**
The California State University
401 Golden Shore
Long Beach, CA 90802

***P8. Recorded by:** Name, affiliation, and address)
Andrew Goodrich, AICP
Architectural Resources Group
360 E. 2nd Street, Suite 225
Los Angeles, CA 90012

***P9. Date Recorded:** 4/8/2022

***P10. Survey Type:** (Describe)
☒ Intensive
☐ Reconnaissance

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") California State University, Long Beach Campus-Wide Historic Resources Survey Report (ARG, 2019)

***Attachments:** NONE ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure & Object Record
☐Archaeological Record ☐ District Record ☐Linear Feature Record ☐ Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photographic Record ☐ Other (List)

BUILDING, STRUCTURE AND OBJECT RECORD

*NRHP Status Code 6Z

B1. Historic Name: Science Building Addition; Science 1
B2. Common Name: Peterson Hall 1 (PH1)
B3. Original Use: Classroom/Office B4. Present Use: Classroom/Office
***B5. Architectural Style** Mid-Century Modern
***B6. Construction History:** (Construction date, alterations, and date of alterations)
(see Page 3)
***B7. Moved?** ☒No ☐Yes ☐Unknown **Date:** **Original Location:**
***B8. Related Features:** (none)

B9a. Architect: California State Division of Architecture b. Builder: Not determined
***B10. Significance: Theme** N/A **Area** N/A
Period of Significance: N/A **Property Type:** N/A **Applicable Criteria:** N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Summary Statement of Significance:
Peterson Hall 1 is not eligible for individual listing in the National Register and California Register. It is also not eligible as part of a historic district. What follows is a discussion of how this determination of eligibility was made.

Historic Contexts
Historic Context: Origins and Development of CSULB
The essential physical characteristics that define the Upper Campus Historic District – notably, its general location, site plan, architectural vocabulary, and symbiotic relationship between buildings and landscape – reflect concerted efforts at campus master planning for CSULB that were implemented in the 1950s and substantially amended in the 1960s. These master planning efforts laid the blueprint for all development at CSULB and played a significant role in shaping the campus's built environment.

What is now known as CSULB was established amid a period of intensive growth in California. Faced with unprecedented population growth and rapid suburbanization in the years after World War II, California's public colleges and universities struggled to keep pace with staggering increases in student enrollment. New campuses were founded at locations across the state that were witnessing significant increases in population. In the CSU system, new campuses were founded at Los Angeles (1947), Sacramento (1947), and Long Beach (1949). Yet more campuses were added in subsequent years at Fullerton (1957), Hayward (1957), Stanislaus (1957), Northridge (1958), Sonoma (1960), San Bernardino (1960), and Dominguez Hills (1960). The growth of California's system of public colleges and universities eventually led to the development of the Donahoe Higher Education Act of 1960, which codified the recommendations of the California Master Plan for Higher Education and assigned different functions to each of California's three institutions of higher learning: the University of California (UC), the California State College system (CSC, later re-branded as CSU), and the California Community College system.

(continued on page 3)

B11. Additional Resource Attributes: (List attributes and codes)
***B12. References:** *(see Page 7)*

(Sketch Map with north arrow required.)

ARG, 2022
Base map source: ESRI World Topo Map

B13. Remarks:

***B14. Evaluator:** Andrew Goodrich, AICP
Architectural Resources Group
360 E. 2nd Street, Suite 225
Los Angeles, CA 90012

***Date of Evaluation:** 4/8/2022

(This space reserved for official comments.)

***Resource Name or #** (Assigned by recorder) Peterson Hall 1 (PH1)

Recorded By: Architectural Resources Group **Date:** 4/8/2022 ☒ Continuation ☐ Update

***B6. Construction History** *(continued from page 2):*

- 1957. Plans unveiled to construct the subject building
- 1959. Original construction of subject building
- 1980 (circa). Name changed from Science Building Addition/Science 1 to Peterson Hall 1

***B10. Significance** *(continued from page 2):*

Meanwhile, administrators were seeking a site for a permanent campus. Fullerton, Santa Ana, Lakewood, and Long Beach had all expressed interest in hosting the campus; in 1950 officials settled on a large, 320-acre swath of land on the eastern flank of Long Beach, much of which was owned by the Bixby family. The site comprised a large, T-shaped area that was punctuated by gently rolling hills and anchored by present-day Seventh (south) and Atherton (north) streets. Bisecting the center of the site was Anaheim Street, which charted a north-south course along the transect of the "T" and divided the campus into two halves: north (Lower Campus) and south (Upper Campus). By 1951, student enrollment had increased significantly, and as a result the apartments could no longer adequately accommodate the needs of the growing institution. Dozens of temporary, wood-frame structures that resembled army barracks were erected at the east end of Lower Campus while a permanent campus was realized.

The seeds of a permanent campus were sown in October 1950, when noted Long Beach architect Hugh Gibbs was selected to develop the institution's first-ever master plan. The master plan was envisioned as a blueprint that would guide the college's physical development in a cogent and cohesive manner, accommodating its programmatic needs while also working within the fiscal parameters set forth by the state. Toward this end, Gibbs developed a master plan that was rooted in the following core principles:

> *It was determined that the overall feeling of the design should stress simplicity without bleakness, dignity without sternness, be straight-forward, emanating a feeling of warmth and friendliness through the use of color and texture in the materials of construction. This approach dares not to be a timid one if it is to serve as an environmental influence in encouraging the students to constructive thought and action. In like manner, if a proper character and atmosphere can be developed on the campus, it will contribute immeasurably to the creative and cultural development of the students.*

The Gibbs master plan laid the groundwork for the physical form of the CSULB campus as it is experienced today. Specifically, it called for all buildings to be constructed of reinforced concrete, a durable material that was intended to evince a sense of permanence. Exterior walls would consist of exposed concrete and would be periodically accentuated by brick, plaster, terra cotta, and metal to add texture and visual interest. Emphasis was placed on orienting classrooms so that they would optimize natural light, and on enhancing the pedestrian experience through features like covered breezeways and integral landscaping. Gibbs called for most development to be located in the Upper Campus, around a central quadrangle whose axis was tilted to make the most of natural light and topography.

Gibbs's master plan for the campus was approved in 1953. Construction of the first permanent buildings began shortly thereafter, with several completed in 1955; others were subsequently added as schedules and funding permitted. While a few of these early buildings were designed by Gibbs himself, most were designed by staff architects employed by the State Division of Architecture, using standardized designs that were replicated across the CSU system as a way of keeping construction costs down. The central quad also began to take shape at this time. Consistent with Gibbs's vision, most campus development was concentrated in the area to the south of Anaheim Street (Upper Campus); Lower Campus remained sparsely developed at this time apart from physical education facilities, athletic fields, and remnants of the temporary structures that supported the institution in its nascence.

Implementation of the Gibbs master plan represented a giant leap forward in the quest to develop a permanent campus. However, there were problems with the Gibbs master plan that soon became evident. Most pressing were issues related to capacity. Per the direction of administrators, Gibbs had developed the master plan to accommodate 5,000 full-time students, but student enrollment significantly surpassed early projections and swelled to 10,000 by the fall of 1960. Issues also arose with the college's reliance on the State Division of Architecture to execute Gibbs's vision. Specifically, administrators and students expressed dissatisfaction with the buildings designed by the State Division of Architecture, with many grousing that these buildings were bland and ubiquitous.

The Gibbs plan also did not include any provisions for student housing, which became a sticking point as student enrollment increased. In response, two dormitories – Los Alamitos and Los Cerritos halls – were constructed in 1959, in a peripheral area to the north and west of the academic core. These, too, were designed by the State Division of Architecture, and almost immediately fell short of meeting demand.

(continued on page 4)

***B10. Significance** *(continued from page 3):*

These issues underscored the pressing need for a new path forward. In 1961, the Board of Trustees for the CSU system had grown so dissatisfied with the quality of design at its campuses that it decided to discontinue using the State Division of Architecture and instead recruit private practice architects to oversee matters related to design and construction. At the Long Beach campus, the noted local architectural firm of Killingsworth-Brady-Smith and Associates was retained in 1962 to serve as consulting campus architect – a role that the firm, and specifically Killingsworth continuously filled until he eventually retired in 2001. Killingsworth's long tenure provided the Long Beach campus with a characteristically cohesive aesthetic that is uniquely suited to its setting and environs.

Killingsworth's first order of business was to revise the master plan for the campus, incorporating successful elements of the previous (Gibbs) plan but also accounting for its shortcomings. Toward this end a new master plan, developed by Killingsworth, was adopted in January 1963. It aspired "to recognize the many fine features of the original campus…[so that the completed college] will have the appearance of a total building program rather than one of parts." The 1963 master plan was decidedly more forward-reaching than its forebear, introducing a number of new design ideas that improved the student experience and continue to wield influence over the physical form of the campus to this day. The 1963 master plan was developed to accommodate an eventual campus population of 20,000 full-time students – far more enrollees than were planned for in the previous iteration of the master plan.

Key elements of Killingsworth's master plan included a monumental new entrance that approached the campus from the south, via Seventh Street; a formal plaza at the terminus of this entrance, dominated by a commanding, nine-story "theme building" that would showcase the campus's prevailing style of architecture; a three-story student union that would be tucked into a hillside site to preserve important views; and additional parking. The plan also called for the closure of Anaheim Road (now State College Drive), eliminating automobile traffic from the campus core, and laid the groundwork for an architectural vocabulary that would be applied across the campus and improve its quality of design.

The symbiotic relationship between buildings, landscapes, and site features was a resonant theme in Killingsworth's master plan. Notably, the plan called for the incorporation of sculpture, pools, fountains, and artwork throughout the central quadrangle "to create visual excitement and stimulation," the planting of trees and vines to counterbalance the rigidity of buildings, and the platting of a 60-foot-wide axial promenade between the Library (south) and the Physical Education building (north) to enhance the pedestrian experience. To Killingsworth, landscaping played just as much a role in shaping the campus's character as did its building program, and contributed to establishing a sense of place. A considerable number of the campus's landscapes were designed by landscape architect Edward "Ed" Lovell of Long Beach, who in 1964 was selected by the college to collaborate with Killingsworth.

Killingworth's master plan also addressed a wide void in the previous iteration of the master plan: student housing. It specifically called for the construction of a new dormitory complex to the northwest of the academic core, where Hillside College is located today. As described in the master plan:

> *Housing in dormitories is planned for 5,000 students on the west portion of the lower campus. This housing will be medium high rise structures with the primary concern directed towards making the living personal and warm. The buildings are set on a residential type street which is separated from the academic life of the campus and directly connected to the cooperative housing [Los Cerritos/Los Alamitos Halls] so that there will be an interaction between these two areas. Food Services are in a separate building located just north of the existing dormitories.*

Construction of the complex began in 1967 and was completed by 1969. Along with the adjacent Los Cerritos and Los Alamitos Halls, it remained the center of residential life at the CSULB campus until additional residence halls – Parkside College and the International House – were built in the 1980s.

<u>Historic Context: Mid-Century Modern Architecture</u>

Peterson Hall 1 is designed in an institutional derivative of the Mid-Century Modern style unique to the CSULB campus, which was applied throughout the campus during its formative years. Conceived by Hugh Gibbs and honed by Ed Killingsworth and the private practice architects with whom he collaborated, this dialect of Modernism provided the campus with a strong sense of aesthetic cohesion and a discernible architectural identity that is rooted in the tenets of the Modern movement.

"Mid-Century Modern" is a broad term that is used to describe the various derivatives of Modern architecture that flourished in the post-World War II period. These include post-war adaptations of the chaste and machined International Style, the rational aesthetic

(continued on page 5)

***Resource Name or #** (Assigned by recorder) Peterson Hall 1 (PH1)

Recorded By: Architectural Resources Group **Date:** 4/8/2022 ☒ Continuation ☐ Update

***B10. Significance** *(continued from page 4)*:

associated with post-and-beam construction, and more organic and expressive interpretations of the Modern architectural movement. Mid-Century Modernism was popular between the mid-1940s and early 1970s. It proved to be a remarkably versatile idiom that was expressed through a wide variety of property types ranging from single residences, to large-scale housing tracts, to commercial buildings, and to institutional properties and college campuses. Its aesthetic was deftly incorporated into both high-style buildings and the local vernacular, and was employed by architects, developer-builders, and lay contractors alike.

Various experiments in Modern architecture that were introduced in the early 20th century lent impetus to the Mid-Century Modern style. The International Style, which came out of Europe in the 1920s, introduced a cogent, straightforward approach to design that was characterized by simple geometries, smooth wall surfaces, the honest expression of structure and materials, and the absence of superfluous ornament. International Style buildings were characteristically lithe, airy, “gleaming and seemingly machine-made.” At about the same time, a group of maverick American architects including Frank Lloyd Wright and Irving Gill were also working with experimental new forms, methods, and materials in their quest to develop a truly indigenous style of American architecture.

Mid-Century Modernism draws upon these earlier paradigms, and is emblematic of how the Modern movement was adapted to the conditions of post-World War II life. Over time, architects took the basic tenets of the International Style and similar experiments in domestic Modernism and modulated them into new dialects of Modernism that were both rational and sensitive to their respective physical and cultural contexts. In Southern California, this was manifest in an architectural vocabulary defined by structural and material expression, wide expanses of glass, and open, free-flowing interior plans. Some architects, captivated by the movement’s emphasis on freedom of form and structural innovation, also incorporated sweeping forms and expressionistic elements into Mid-Century Modern design, referencing the organic and sculptural tendencies of architects like Frank Lloyd Wright and John Lautner.

Arguably more than anywhere else, Southern California was a locus of innovation with respect to post-war Modernism. In large part, this can be attributed to the advent of *Arts & Architecture* magazine’s Case Study House Program, an internationally recognized showcase of residential design that was commissioned by the magazine’s forward-reaching editor, John Entenza. Commencing in 1945 and continuing until 1966, the program publicized a total of thirty-six prototypical dwellings that were designed by a cadre of progressive architects, many of whom who would go on to become some of the region’s foremost exponents of postwar Modernism. Entenza foresaw the extraordinary demand for new housing that affected American society after World War II, and intended for the program to showcase, in real time, how modern materials and methods could be applied to produce high-quality dwellings that were suited to mass production and attainable to the burgeoning middle class.

Different variants of the Mid-Century Modern style emerged as the movement gained traction and became more mainstream. The style was favored by large-scale institutional properties such as colleges and universities, which were tasked with developing large, dense, multimodal campuses to accommodate the droves of incoming students seeking higher education in the postwar period. Mid-Century Modernism’s emphasis on rational, economic buildings that could be produced en masse lent themselves especially well to these institutions, which needed to expand quickly and within the confines of capital construction budgets. In contrast to the extravagantly ornamented Gothic Revival and Romanesque Revival styles that had previously been favored by institutions of higher learning in earlier decades, Mid-Century Modernism utilized materials that were generally more cost effective and readily available. Industrial materials like cast concrete, steel structural frames, and laminated beams were used in lieu of structural brick, terra cotta, or stone, significantly reducing construction costs.

The group of architects who shaped and melded the CSULB campus during its formative years developed a variant of Modernism that was applied across the campus and provided it with its characteristically unified aesthetic. This visual vocabulary was set into motion by original master plan architect Hugh Gibbs, who in 1953 established the prevailing scale and dominant material types for all new campus buildings. In the 1960s, Killingsworth took these design principles a step further, transposing them into a codified architectural vocabulary that was intended to bridge existing buildings with new construction and ensure that all development on campus was orderly and cohesive. Per Killingsworth, all buildings were to be constructed of concrete; roofs were to be flat; exterior walls were to be finished in slender Norman bricks, painted concrete, and/or textured plaster; windows were to be metal sash and, when applicable, covered with aluminum sunscreens finished in bronze tones; and building and site features would ascribe to a neutral color palette based on the Plochere Color System.

Generally, the Mid-Century Modern style, expressed in the context of public institutional architecture and the architecture of CSULB, exhibits the following character-defining features:

(continued on page 6)

***Resource Name or #** (Assigned by recorder) Peterson Hall 1 (PH1)

Recorded By: Architectural Resources Group **Date:** 4/8/2022 ☒ Continuation ☐ Update

***B10. Significance** *(continued from page 5)*:

- Simple, geometric building forms
- Concrete, steel, and glass construction (larger buildings); wood construction (smaller buildings)
- Direct expression of the structural system
- Flat roofs, with or without eaves
- Flush-mounted metal frame windows (often expressed as curtain walls in larger buildings)
- Metal window screens (*brise soleil*), often comprising geometric patterns or motifs
- Minimal surface ornament and decorative details
- Integrated landscapes, often expressed as courtyards or plazas

Historic Context: California State Division of Architecture
Peterson Hall 1 was designed by the California State Division of Architecture.

The California State Division of Architecture is involved in project design and construction oversight over buildings in California that are publicly funded. This agency was created in 1933 under the auspices of the Field Act, which was passed in the wake of the Long Beach Earthquake (1933) and set mandates for earthquake-resistant construction through design standards and quality control procedures. Its staff of architects are involved in the design and construction of public buildings and facilities across the state, and typically design in architectural idioms that are popular at the time. Most of the early buildings at CSULB – those that were constructed in the 1950s and 1960s – were designed by the State Division, presumably as a way of streamlining design and keeping construction costs low. A majority of the early buildings at CSULB were designed by the State Division of Architecture. By the late 1960s, the university had begun to move away from relying on the State Division of Architecture, and instead recruited private practice architects to design new campus buildings under the direction of the campus's consulting architect, Edward Killingsworth.

Evaluation of Significance
Individual Eligibility
Peterson Hall 1 is not individually eligible for listing in the National Register or California Register. It was built in 1959, at the apex of the CSULB campus's formative period of growth; however, when removed from its environs and evaluated on its own merits the building does not, in and of itself, convey patterns of campus planning and development in a particularly meaningful way. Rooted in principles of campus master planning, significant patterns of early development at CSULB are best expressed as historic districts, as it is the synergy and interrelationship between its buildings and site/landscape features – and not the presence of any one particular building or feature – that conveys a visual sense of the overall historic environment from this period. In addition, there is insufficient evidence demonstrating that the building was the site of a singular event that is shown to be significant to history. The building, then, is not associated with significant events or patterns of events and does not satisfy National/California Register Criterion A/1.

Peterson Hall 1 has been used by generations of students, faculty, staff, and others since its original construction in 1959. However, this is a common characteristic of university buildings – and especially classrooms – which, by their nature, are intended to be occupied by a variety of people. It is not a quality that is unique to this building. There is insufficient evidence linking the productive life of a significant individual to Peterson Hall 1. Absent any such evidence, there is no basis to conclude that the building is associated with the lives of persons significant to our past. The building does not satisfy National /California Register Criterion B/2.

Peterson Hall 1 is designed in an institutional derivative of the Mid-Century Modern style that was applied to buildings across the CSULB campus to provide the campus with a sense of uniformity and cohesion in its formative years. Thus, the building shares common characteristics with other campus buildings dating to the same general period of development. However, when evaluated separate and apart from its environs and on its own merits, the building does not stand out as a strong architectural statement. It exhibits some characteristics of the Mid-Century Modern style, but lacks the degree of articulation that would be needed to justify architectural significance. As a typical institutional building that lacks architectural gravitas, it does not possess high artistic values, and there is nothing particularly notable about its type, period or method of construction. The California State Division of Architecture – the building's architect of record – is an agent of state bureaucracy that was charged with designing public buildings efficiently and is not considered to be a master architect. For these reasons the building does not satisfy National/California Register Criterion C/3.

(continued on page 7)

***Resource Name or #** (Assigned by recorder) Peterson Hall 1 (PH1)

Recorded By: Architectural Resources Group **Date:** 4/8/2022 ☒ Continuation ☐ Update

***B10. Significance** *(continued from page 6)*:

As an archaeological assessment was not conducted as part of this study, the building's potential for containing subsurface archaeological resources is unknown. It was not evaluated against National/California Register Criterion D/4.

Historic District Eligibility

Peterson Hall 1 is adjacent to the Upper Campus Historic District. The district was identified as eligible for listing in the National/California Register in a campus-wide historic resources survey that was completed in 2019. The district is eligible under Criterion A/1 for its association with campus master planning; and under Criterion C/3 as a notable, intact concentration of Mid-Century Modern style institutional architecture and as the work of multiple masters including Gibbs and Gibbs, Killingsworth-Brady and Associates, and Edward Lovell. The district contains 28 buildings (24 contributing) and has a period of significance of 1953-1972.

In spite of its adjacency to the Upper Campus Historic District, Peterson Hall 1 does not contribute to the district due to extensive alterations to its setting. The building was designed as part of a unit composed of three adjacent science-oriented buildings: the original Science Building (later Peterson Hall 2, and now the Student Success Center) was built in 1955; the Science Hall Addition (now Peterson Hall 1) was built in 1959 as the second unit; and the Science Hall Addition No. 3 (later Peterson Hall) was built in 1961. All were designed by the State Division of Architecture in a similar iteration of the Mid-Century Modern style, and all were intended to complement one another in terms of design and function. Together they formed the nucleus of the campus's science-based instruction. However, of these three complementary buildings only Peterson Hall 1 remains. Peterson Hall 3 was demolished in 2008 and subsequently replaced with a new building (Hall of Science, completed 2011); Peterson Hall 2 was extensively remodeled in 2019 and is now known as the Student Success Center. Both the Hall of Science and Student Success Center present as contemporary additions to the CSULB campus and fall well outside the original, Mid-Century Modern aesthetic that defined the campus in its initial period of development. As a result, Peterson Hall 1 – while still standing – is now a fragment of what was once a cohesive whole.

National Register Bulletin 16A: How to Complete the National Register Registration Form provides guidance on how to select appropriate district boundaries. It states that one of the factors to taken into consideration when selecting a boundary involves "visual changes in the character of the area due to different architectural styles, types or periods, or to a decline in the concentration of contributing resources." The modifications that have been made to the science building complex has resulted in visual changes to the aesthetic character of this complex of buildings and has compromised the ability of this complex of buildings to meaningfully converse with other buildings within the Upper Campus Historic District, which are unified by their visual cohesion and shared sense of time and place. For this reason Peterson Hall 1 does not contribute to the significance of the Upper Campus Historic District.

***B14. References** *(continued from page 2)*:

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(continued on page 8)

***Resource Name or #** (Assigned by recorder) Peterson Hall 1 (PH1)

Recorded By: Architectural Resources Group **Date:** 4/8/2022 ☒ Continuation ☐ Update

***B14. References** *(continued from page 7):*

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National Register of Historic Places Multiple Property Documentation Form. "The Case Study House Program: 1945-1966." Prepared Dec. 2012, revised Mar. 2013.

Shivers, Natalie W. "Architecture: A New Creative Medium." *LA's Early Moderns: Art/Architecture/ Photography*. Los Angeles: Balcony Press, 2003.

***Resource Name or #** (Assigned by recorder) Peterson Hall 1 (PH1)

Recorded By: Architectural Resources Group **Date:** 4/8/2022 ☒ Continuation ☐ Update

Image 2. South façade, view northwest (ARG, 2019)

Image 3. Projecting volume on south façade, view northeast (ARG, 2019)

Image 4. South façade, view northeast (ARG, 2019)

Image 5. South and east façades, view northwest (ARG, 2019)

Image 6. Peterson Hall 1 (pictured left), north façade, 1992 (CSULB Library Special Collections and University Archives)

Image 7. Peterson Hall 1 (pictured left), east façade, 1998 (CSULB Library Special Collections and University Archives)

APPENDIX B2

Cultural Resources Technical Memorandum

-Confidential-

APPENDIX C

Energy Assessment

taha environmental planners

Technical Memorandum

TO: Jane Chang
AECOM Technical Services Inc.

FROM: Terry A. Hayes Associates Inc.

DATE: May 18, 2022

RE: California State University, Long Beach (CSULB) Peterson Hall 1 Replacement Project – Energy Assessment

Introduction

This Energy Assessment for the CSULB Peterson Hall 1 Replacement Project (proposed project) analyzes the potential environmental impacts associated with the implementation of the Peterson Hall 1 Replacement Building Project (proposed project) on the CSULB campus. The existing Peterson Hall 1 (PH1) building was proposed for demolition and replacement in the Campus Master Plan and Campus Master Plan Update EIR (State Clearinghouse #2007061092), certified by the CSU Board of Trustees in May 2008 (2008 EIR). CSULB now proposes to implement this project with modifications compared to its original description in the 2008 Campus Master Plan, necessitating the preparation of additional environmental analysis and documentation in conformance with the California Environmental Quality Act (CEQA) Guidelines. The 2008 EIR did not analyze energy resources.

Terry A. Hayes Associates Inc. (TAHA) has completed an Energy Assessment for the CSULB Peterson Hall 1 Replacement Project (proposed project) in accordance with provisions of California Environmental Quality Act (CEQA) Statutes and Guidelines. This Assessment is organized as follows:

- Project Description
- Energy Topical Information
- Regulatory Framework
- Significance Thresholds
- Methodology
- Impact Analysis
- References

Project Description

The proposed project is located in the City of Long Beach, California, specifically within the California State University, Long Beach (CSULB) property. **Figure 1** shows the project location in the City of Long Beach, **Figure 2** shows the location of the proposed project within the CSULB boundary, and **Figure 3** shows the conceptual site plan of the proposed project.

Figure 1

Regional Map

Figure 2

Project Location Map

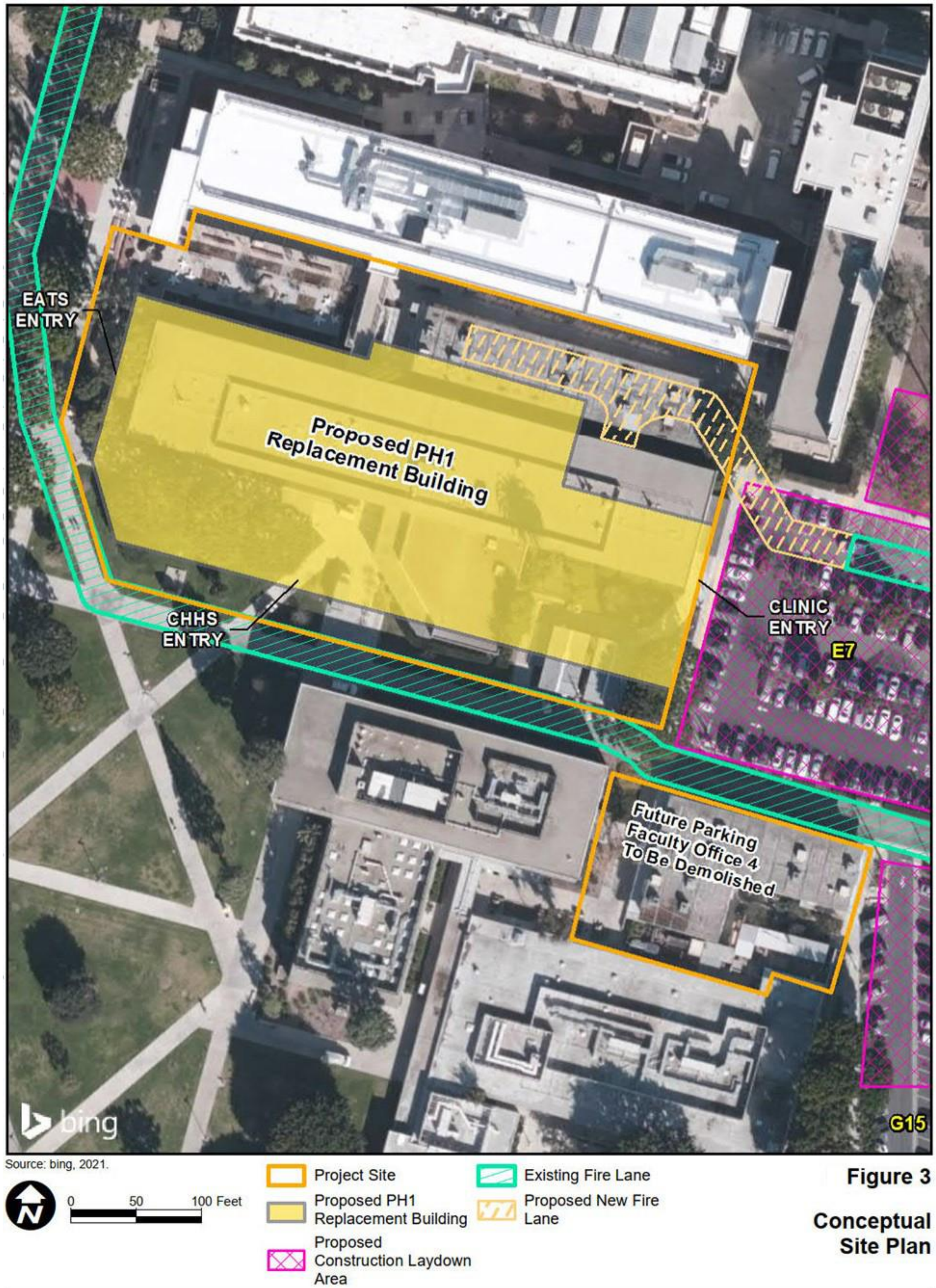

Figure 3

Conceptual Site Plan

The existing PH1 building was proposed for demolition and replacement in the Campus Master Plan and Campus Master Plan Update EIR, certified by the CSU Board of Trustees in May 2008 (2008 EIR). CSULB now proposes to implement this project with modifications compared to its original description in the 2008 Campus Master Plan, necessitating the preparation of additional environmental analysis and documentation in conformance with the CEQA Guidelines. All applicable mitigation measures from the 2008 EIR would be applicable to the proposed project.

Similar to the approved project, the current proposed project involves demolition of the existing PH1 building and temporary Faculty Office 5 (FO5) building as well as construction of a new building. In the time since the 2008 EIR, Peterson Hall 2 (PH2) has undergone a renovation, which included a small addition, rather than the originally contemplated replacement of the PH2 building. As such, PH2 would remain in use and is not part of the current proposed project. The 2008 Campus Master Plan proposed two new buildings to accommodate replacement lecture and laboratory space as well as approximately 170 faculty offices. Instead of constructing two new replacement buildings as contemplated in the 2008 EIR, the proposed project would construct one new three-story building. The proposed building would include lecture and lab space, as well as faculty offices, similar to the approved project.

In addition, the proposed project would include uses not originally contemplated in the 2008 EIR, including a public clinic to be operated in cooperation with a local Clinical Healthcare provider partner (clinical partner), under a teaching clinic model. The proposed project would also require demolition of the Faculty Office 4 (FO4) temporary building to accommodate a surface parking lot to serve the clinic, which was not originally contemplated for the approved project.

The proposed project site includes the existing PH1 building, FO4, FO5, and construction laydown and equipment storage areas, and is located in the southern portion of the campus, as shown in **Figure 2**. The proposed project would construct a new 137,072 gross square feet, three-story building for the College of Health and Human Services (CHHS) to replace the existing PH1 building, and the FO4 and FO5 temporary office buildings. The replacement facility would occupy the PH1 and FO5 building footprints. FO4 would become future additional surface parking. The new building would include faculty space, student collaboration space, teaching labs, research labs, administration space, a medical simulation center, and a clinic to be operated in cooperation with a local regional hospital. Office construction would implement the CSULB office space standards of 90 ASF for faculty offices, which would provide the equivalent of 134 new faculty offices. The replacement building would be open to students during normal academic hours as well as evenings and weekends to support academic scheduling and student self-study needs.

The clinic would be based on a “teaching-clinic model” and would be located on the first floor of the replacement building. The clinic would operate Monday through Friday from 8:00 a.m. to 5:00 p.m. and would not have an urgent care component. FO4 would be demolished and replaced with a surface parking lot that would provide approximately 45 new dedicated parking spaces for the clinic, which would be available for use by the campus outside of clinic hours. Construction of the proposed project is anticipated to take approximately 24 months to complete, commencing in September 2023 and concluding in September 2025.

Operations of the proposed project would generate an estimated 564 daily trips, including 52 morning peak hour trips (31 trips entering, 21 trips exiting), and 63 evening peak hour trips (29 trips entering, 34 trips exiting). This trip generation includes trips from the clinic staff, clinic patients, CSULB students, and CSULB employees.

Energy Topical Information

Electricity

California consumed approximately 250,174,672 megawatt hours (mWh) of electricity in 2021.[1] Approximately 43 percent of electricity was consumed by residential users and 42 percent by commercial users. Industrial users consumed approximately 15 percent of electricity and less than one percent was used to power vehicles.[2] Electricity in the project area is provided by the Southern California Edison (SCE), which serves approximately 180 cities in 15 counties across Central and Southern California. SCE's energy portfolio is made up of approximately 33 percent unspecified sources of power (electricity from transactions that are not traceable to specific generation sources), 35 percent renewables (wind, solar, eligible hydroelectric, and geothermal), 16 percent natural gas, 8 percent large hydroelectric, and 8 percent nuclear.[3]

Natural Gas

California consumed approximately 2,074,302 million cubic feet of natural gas in 2020.[4] Approximately 34 percent of natural gas was consumed by industrial users, followed by 30 percent for electric power generation, 23 percent for residential, 12 percent for commercial, and one percent for vehicle fuel in 2020.[5] Natural gas is currently provided to the project site and campus by the Southern California Gas Company (SoCalGas). According to the 2021 Supplemental California Gas Report, SoCalGas provided an average of 2,468 million metric cubic feet (MMcf) to its service area per day in 2020.[6] According to the 2020 California Gas report, SoCalGas anticipates total gas demand to decline at an annual rate of 1 percent from 2020 to 2035. This decline in throughput demand can be attributed to modest economic growth, California Public Utilities Commission (CPUC) energy efficiency standards mandates and programs, tighter standards created by revised Title 24 Codes and Standards, renewable electricity goals, the decline in commercial and industrial demand, and conservation savings linked to Advanced Metering Infrastructure.[7]

Petroleum

California was the seventh largest producer of crude oil among the 50 states in 2019, as of January 2020, third in oil refining capacity after Texas and Louisiana. In 2020, California produced approximately 143,114 thousand barrels of crude oil.[8] In California, approximately 11.2 billion gallons of gasoline and 1.6 billion gallons of diesel, including off-road diesel were sold and consumed in 2020. Approximately 97 percent of all gasoline consumed in California is utilized by light-duty cars, pickup trucks, and sport utility vehicles. Nearly all heavy-duty trucks, delivery vehicles, buses, trains, ships, boats and barges, farm, construction, and heavy-duty military vehicles have diesel engines.[9]

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[1]U.S. Energy Information Administration, *California State Electricity Profile 2020*, November 4, 2021.

[2] U.S Energy Information Administration, California State Electricity Profile 2020, Table 3: Top Five Retailers of Electricity with End Use Sectors, November 4, 2021.

[3]Southern California Edison, *2019 Power Content Label*, October, 2020.

[4]U.S. Energy Information Administration, *California Natural Gas Consumption by End Use,* November 30, 2021.

[5]Ibid.

[6]California Gas and Electric Utilities, 2021 Supplemental California Gas Report, 2021.

[7]California Gas and Electric Utilities, 2020 California Gas Report, 2020.

[8]U.S. Energy Information Administration, *California State Energy Profile*, November 18, 2021.

[9]California Energy Commission, *Energy Almanac*, available at https://www.energy.ca.gov/data-reports/energy-almanac, accessed December 7, 2021.

Regulatory Framework

In response to growing scientific and political concern with global climate change, a series of federal and state laws have been adopted to reduce GHG emissions. The following provides a brief summary of GHG regulations and policies. This is a not an exhaustive list of all regulations and policies.

Federal

Federal Energy Policy and Conservation Act. In 1975, Congress enacted the Federal Energy Policy and Conservation Act, which established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the Act, the National Highway Traffic Safety Administration is responsible for establishing additional vehicle standards. In 2012, new fuel economy standards for passenger cars and light trucks were approved for model years 2017 through 2021 (77 *Federal Register* 62624–63200). Fuel economy is determined based on each manufacturer's average fuel economy for the fleet of vehicles available for sale in the United States.

Energy Independence and Security Act of 2007. On December 19, 2007, the Energy Independence and Security Act of 2007 (EISA) was signed into law. In addition to setting increased Corporate Average Fuel Economy standards for motor vehicles, the EISA includes the following provisions related to energy efficiency:

- Renewable Fuel Standard (RFS) (Section 202)
- Appliance and Lighting Efficiency Standards (Sections 301–325)
- Building Energy Efficiency (Sections 411–441)

This federal legislation requires ever-increasing levels of renewable fuels to replace petroleum. The U.S. Environmental Protection Agency (USEPA) is responsible for developing and implementing regulations to ensure that transportation fuel sold in the United States contains a minimum volume of renewable fuel. The RFS program regulations were developed in collaboration with refiners, renewable fuel producers, and many other stakeholders.

The RFS program was created under the Energy Policy Act of 2005 and established the first renewable fuel volume mandate in the United States. As required under the Act, the original RFS program (RFS1) required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012. Under the EISA, the RFS program was expanded in several key ways that lay the foundation for achieving significant reductions in greenhouse gas (GHG) emissions from the use of renewable fuels, reducing imported petroleum, and encouraging the development and expansion of the renewable fuels sector in the United States. The updated program is referred to as "RFS2" and includes the following:

- EISA expanded the RFS program to include diesel, in addition to gasoline.
- EISA increased the volume of renewable fuel required to be blended into transportation fuel from nine billion.
- EISA established new categories of renewable fuel, and set separate volume requirements for each one.
- EISA required the USEPA to apply lifecycle GHG performance threshold standards to ensure that each category of renewable fuel emits fewer GHGs than the petroleum fuel it replaces.

Additional provisions of the EISA address energy savings in government and public institutions, research for alternative energy, additional research in carbon capture, international energy programs, and the creation of “green” jobs.

State

Warren-Alquist Act. The California Legislature passed the Warren-Alquist Act in 1974. The Warren-Alquist Act created the California Energy Commission (CEC). The legislation also incorporated the following three key provisions designed to address the demand side of the energy equation:

- It directed the CEC to formulate and adopt the nation’s first energy conservation standards for both buildings constructed and appliances sold in California.
- The Act removed the responsibility of electricity demand forecasting from the utilities, which had a financial interest in high-demand projections, and transferred it to a more impartial CEC.
- The CEC was directed to embark on an ambitious research and development program, with a particular focus on fostering what were characterized as non-conventional energy sources.

State of California Energy Action Plan. The CEC and CPUC approved the first State of California Energy Action Plan in 2003. The plan established shared goals and specific actions to ensure that adequate, reliable, and reasonably priced electrical power and natural gas supplies are provided, and identified policies, strategies, and actions that are cost-effective and environmentally sound for California’s consumers and taxpayers. In 2005, a second Energy Action Plan was adopted by the CEC and CPUC to reflect various policy changes and actions of the prior two years.

At the beginning of 2008, the CEC and CPUC determined that it was not necessary or productive to prepare a new energy action plan. This determination was based, in part, on a finding that the state’s energy policies have been significantly influenced by the passage of Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006 (discussed below). Rather than produce a new energy action plan, the CEC and CPUC prepared an “update” that examines the state’s ongoing actions in the context of global climate change.

Senate Bills 1078 (2002), 107 (2006), X1-2 (2011), 350 (2015), and 100 (2018). Senate Bill (SB) 1078 established the California Renewables Portfolio Standard (RPS) Program and required that a retail seller of electricity purchase a specified minimum percentage of electricity generated by eligible renewable energy resources as defined in any given year, culminating in a 20-percent standard by December 31, 2017. These retail sellers include electrical corporations, community choice aggregators, and electric service providers. The bill also required the CEC to certify eligible renewable energy resources, design and implement an accounting system to verify compliance with the RPS by retail sellers, and allocate and award supplemental energy payments to cover above-market costs of renewable energy. SB 107 accelerated the RPS established by SB 1078 by requiring that 20 percent of electricity retail sales be served by renewable energy resources by 2010 (not 2017). Additionally, SB X1-2 requires all California utilities to generate 33 percent of their electricity from eligible renewable energy resources by 2020. Specifically, SB X1-2 sets a three-stage compliance period: by December 31, 2013, 20 percent had to come from renewables; by December 31, 2016, 25 percent had to come from renewables; and by December 31, 2020, 33 percent will come from renewables.

SB 350 expanded the RPS because it requires retail seller and publicly owned utilities to procure 50 percent of their electricity from eligible renewable energy resources by 2030, with interim goals of 40 percent by 2024 and 45 percent by 2027.

SB 100 accelerated and expanded the standards set forth in SB 350 by establishing that 44 percent of the total electricity sold to retail customers in California per year by December 31, 2024, 52 percent by December 31, 2027, and 60 percent by December 31, 2030 be secured from qualifying renewable energy sources. SB 100 also states that it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100 percent of the retail sales of electricity to California. This bill requires that the achievement of 100 percent zero-carbon electricity resources does not increase the carbon emissions elsewhere in the western grid and that the achievement not be achieved through resource shuffling.

Consequently, utility energy generation from non-renewable resources is expected to be reduced based on implementation of the 60-percent RPS in 2030. Therefore, any project's reliance on non-renewable energy sources would also be reduced.

Assembly Bill 1007 (2005). Assembly Bill (AB) 1007 required the CEC to prepare a statewide plan to increase the use of alternative fuels in California (State Alternative Fuels Plan). The CEC prepared the plan in partnership with the California Air Resources Board (CARB) and in consultation with other state agencies, plus federal and local agencies. The State Alternative Fuels Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce GHG emissions, and increase in-state production of biofuels without causing significant degradation of public health and environmental quality.

Assembly Bill 32 (2006) and Senate Bill 32 (2016). In 2006, the State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020. In 2016, the Legislature enacted SB 32, which extended the horizon year of the state's codified GHG reduction planning targets from 2020 to 2030, requiring California to reduce its GHG emissions to 40 percent below 1990 levels by 2030. In accordance with AB 32 and SB 32, CARB prepares scoping plans to guide the development of statewide policies and regulations for the reduction of GHG emissions. Many of the policy and regulatory concepts identified in the scoping plans focus on increasing energy efficiencies, using renewable resources, and reducing the consumption of petroleum-based fuels (such as gasoline and diesel). As such, the state's GHG emissions reduction planning framework creates co-benefits for energy-related resources.

California Building Energy Efficiency Standards (Title 24, Part 6). The California Building Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) were adopted to ensure that building construction and system design and installation achieve energy efficiency and preserve outdoor and indoor environmental quality. The 2019 Title 24 Standards went into effect on January 1, 2020. The 2019 Title 24 Standards represent "challenging but achievable design and construction practices" that represent a major step towards meeting the Zero Net Energy (ZNE) goal." Homes built with the 2019 standards will use about 7 percent less energy due to energy efficiency measures versus those built under the 2016 standards. Once rooftop solar electricity generation is factored in, homes built under the 2019 standards will use about 53 percent less energy than those built under the 2016 standards. The California Building Code is updated triennially and is expected to become more energy efficient with each update.

California Green Building Standards (Title 24, Part 11). The California Green Building Standards Code (California Code of Regulations, Title 24, Part 11), commonly referred to as the CALGreen Code, includes mandatory measures related to energy efficiency, water efficiency and conservation, material conservation, resource efficiency, and environmental quality. Compliance with the CALGreen Code is enforced through the building permit process.

Integrated Energy Policy Report. The CEC is responsible for preparing integrated energy policy reports that identify emerging trends related to energy supply, demand, conservation, public health and safety, and maintenance of a healthy economy. The CEC's Integrated Energy Policy Report discusses the state's policy goals of decarbonizing buildings, doubling energy efficiency savings, and increasing flexibility in the electricity grid system to integrate more of renewable energy. Specific to the decarbonizing of building energy, the goal would be achieved by designing future commercial and residential buildings to source their energy almost entirely from electricity in place of natural gas. Regarding the increase in renewable energy flexibility, the goal would be achieved through increases in energy storage capacity within the state, increases in energy efficiency, and adjusting energy use to the time of day when the most amount of renewable energy is being generated. Over time as they are implemented, these policies and trends would serve to beneficially reduce the GHG emissions profile and energy consumption from projects. The latest version of the report was published in March 2021 and is titled *Final 2020 Integrated Energy Policy Report Update*.

State Vehicle Standards. In response to the transportation sector accounting for more than half of California's carbon dioxide (CO_2) emissions, AB 1493 was enacted in 2002. AB 1493 required CARB to set GHG emissions standards for passenger vehicles, light-duty trucks, and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the state. The bill required that CARB set GHG emissions standards for motor vehicles manufactured in 2009 and all subsequent model years. The 2009-2012 standards resulted in a reduction in approximately 22 percent of GHG emissions compared to emissions from the 2002 fleet, and the 2013-2016 standards resulted in a reduction of approximately 30 percent.

In 2012, CARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and global-warming gases with requirements for greater numbers of zero-emissions vehicles into a single package of standards called Advanced Clean Cars. By 2025, when the rules would be fully implemented, new automobiles would emit 34 percent fewer global-warming gases and 75 percent fewer smog-forming emissions. Although the focus of the state's vehicle standards is on the reduction of air pollutants and GHG emissions, one co-benefit of implementation of these standards is a reduced demand for petroleum-based fuels.

Sustainable Communities Strategy. The Sustainable Communities and Climate Protection Act of 2008, or SB 375, coordinates land use planning, regional transportation plans, and funding priorities to help California meet its GHG emissions reduction mandates established in AB 32. As codified in California Government Code Section 65080, SB 375 requires metropolitan planning organizations (MPOs; e.g., the Southern California Association of Governments [SCAG]) to include a Sustainable Communities Strategy (SCS) in their Regional Transportation Plan (RTP). The main focus of the SCS is to plan for growth in a fashion that will ultimately reduce GHG emissions, but the strategy is also part of a bigger effort to address other development issues, including transit and vehicle miles traveled, which influence the consumption of petroleum-based fuels.

Regional

Southern California Association of Governments (SCAG) 2020–2045 Regional Transportation Plan/ Sustainable Communities Strategy (RTP/SCS). The SCAG Regional Council formally adopted the *Connect SoCal 2020–2045 RTP/SCS* (Connect SoCal) on September 3, 2020. Rooted in the 2008 and 2012 RTP/SCS plans, Connect SoCal's "Core Vision" focuses on maintaining and enhancing management of the transportation network while also expanding mobility choices by creating hubs that connect housing, jobs, and transit accessibility. The "Core Vision" of Connect SoCal is organized into six key focus areas that expand upon progress made in the 2016 RTP/SCS: Sustainable Development, System Preservation and Resilience, Demand & System Management, Transit Backbone, Complete Streets, and Goods Movement. Connect SoCal incorporates a range of best practices for increasing transportation choices, reducing dependence on personal automobiles, further improving air quality and reducing GHG emissions, and encouraging growth in walkable, mixed-use communities with convenient access to transit infrastructure and employment.

Significance Thresholds

Based on Appendix G of the State CEQA Guidelines, the proposed project would have a potentially significant effect on GHGs if it would:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; and/or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Methodology

Appendix F of the CEQA Guidelines states that the goal of conserving energy implies the wise and efficient use of energy, to be achieved by decreasing overall per capita energy consumption; decreasing reliance on natural gas and oil; and increasing reliance on renewable energy resources. To assure energy implications are considered in project decisions, CEQA requires that environmental impact reports include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy. Energy conservation implies that a project's cost effectiveness be reviewed in terms of energy requirements, not only dollar amount.

The air quality analysis prepared for the proposed project, included in the appendix for the environmental documentation, includes a quantification of construction and operational carbon dioxide equivalent (CO_2e) emissions using the California Emissions Estimator Model. These emissions were used to estimate construction energy from CO_2e emission factors derived for the CARB GHG emissions inventory. The 2021 Climate Registry indicates that for gasoline fuel, approximately 8.78 kilograms of CO_2 are generated per gallon combusted, and for diesel fuel, approximately 10.21 kilograms of CO_2 are generated per gallon combusted. The fuel consumption was estimated from the equipment and vehicles that would be employed in construction and operational activities. Diesel engines are installed in heavy-duty off-road construction equipment and on-road haul trucks. Gasoline engines are typically found in passenger vehicles that would be used for construction worker daily commutes and trips associated with the clinic.

Impact Assessment

The following analysis discusses short-term (construction) and long-term (operational) use of electricity, natural gas, and petroleum.

a) Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation. (Less-than-Significant Impact)

Electricity

Construction. Construction of the proposed project would require electricity for lighting, construction trailers, and operation of electrically powered hands tools. Electricity to the site would be provided by SCE and it is likely that most electrically powered equipment would connect to the grid. Consumption of electricity for construction would be minimal and would cease after completion of the proposed project. Electricity use would be minimized to the extent feasible through incorporation of sustainability features and best management practices. Therefore, construction of the proposed project would result in a less than significant impact related to wasteful, inefficient, or unnecessary consumption of electricity.

Operation. Electricity consumption during operation of the proposed project would be primarily related to lighting, heating and cooling of the building. The existing building does not comply with Title 24, Part 6, of the California Code of Regulations. The replacement building would incorporate energy-efficiency, sustainability, water- and waste-efficiency, and resiliency features to achieve a Net Zero Energy (NZE) Rating and a LEED Gold, or better, building rating. The NZE Rating ensure that there would be no potential for an energy impact. In addition, in accordance with the CSU and campus energy and sustainability goals and polices, it is the University's goal for the proposed project to be NZE building with an annual delivered energy that is greater than or equal to the combination of on-site and campus-wide renewable energy. The expectation is to achieve these goals by designing an efficient building focused on load reductions, efficient systems, regeneration/reuse and renewable systems. In order to achieve a NZE goal, the energy use intensity (EUI) target range would be between 35-45 kBTU/SF. This EUI target allows most low-rise projects to accommodate on-site photovoltaics (PV) on the roof. Note that the existing 4.8 MW solar installation in parking lots G6-G8 may be used for the proposed project to offset building energy use. The extent of such use would be determined during design to optimize the size of building PV systems in conjunction with the use of existing campus PV arrays to best-meet the zero-net energy project intent and goals. In summary, the proposed project would operate with energy efficiencies and would not result in permanent wasteful, inefficient, or unnecessary consumption of energy resources. Therefore, operation of the proposed project would result in a less than significant impact related to wasteful, inefficient, or unnecessary consumption of electricity.

Natural Gas

Construction. Construction activities typically do not require the consumption of natural gas to power equipment or heavy machinery. Natural gas that would be consumed during construction would be negligible and would not result in a significant drain on natural gas resources. Therefore, construction of the proposed project would result in a less than significant impact related to wasteful, inefficient, or unnecessary consumption of natural gas.

Operation. In accordance with the CSU and campus carbon reduction goals and polices, it is the University's goal for the proposed project to minimize the use of natural gas during operation though the use of electrification technologies for space heating, cooling, and domestic water heating. The extent of natural gas usage would be determined during design.

A central plant capacity study is currently ongoing to analyze the existing central plant distribution system to ensure adequate capacity for the new building. The central plant would potentially supply hot water and chilled water for building heating and cooling. The central plant uses electric chillers to generate chilled water and natural gas fired boilers to general hot water. It is anticipated that future upgrades to the central plant would include transition from natural gas to electricity for hot water generation. Due to potential central plan capacity issues, and to accommodate afterhours requirements for the new building operations, the proposed project would study options for central plant supplied heating and cooling, satellite central plant at the new building, and building based electric variable refrigerant flow (VRF) systems (or similar building based systems) for building space heating and cooling during design.

The intent of the satellite plant option is to support the building during peak University heating and cooling periods and after hour conditions, but also allow for tie-in to the existing central plant infrastructure. This tie-in option would be a source of primary cooling and heating during low load campus wide conditions. However, if it is deemed due to analysis of existing infrastructure impact of the new building on the existing distribution system and the central plant can provide after hour operation with minimal impacts, then the satellite plant would be not necessary.

Natural gas consumption during operation of the proposed project would be primarily related to water heating and space heating of the building should they not be provided by electrification technology. Additionally, minor anticipated natural usage is anticipated in building laboratories. Annual natural gas consumption is anticipated to be no more than 2,461.8 million British thermal units (MMBTU) per year. The natural gas use is consistent with other small infill projects and not a significant use of natural gas. The proposed project includes sustainable design features to meet and/or exceed energy goals, including exceeding Title 24 energy requirements. Therefore, operation of the proposed project would result in a less than significant impact related to wasteful, inefficient, or unnecessary consumption of natural gas.

Petroleum

Construction. Petroleum would be consumed during the demolition, excavation, and construction phases of the proposed project by heavy-duty equipment, which is usually diesel powered. Construction of the proposed project would result in the consumption of gasoline and diesel fuels by haul trucks, deliveries, and construction worker commute trips. **Table 1** shows that a one-time expenditure of approximately 85,727.4 gallons of diesel fuel and 117,266.2 gallons of gasoline would be needed to construct the proposed project. Petroleum consumption during construction would be typical of urban infill projects and not excessive.

The proposed project would use best practices to eliminate the potential for the wasteful consumption of petroleum. Exported materials (e.g., demolition debris and soil hauling) would be disposed of at the Puente Hills Materials Recovery Facility located at 2808 Workman Mill Road in Whittier, California; haul trucks would travel east on State Route 22 then north on Interstate 605 to reach this destination from the project site. The proposed project would be required to comply with CARB's Airborne Toxics Control Measure, which restricts heavy-duty diesel vehicle idling time to five minutes. Therefore, because petroleum use would be minimized to the extent feasible and represents a relatively small amount of fuel consumption, construction of the proposed project would result in a less than significant impact related to wasteful, inefficient, or unnecessary consumption of petroleum.

TABLE 1: CONSTRUCTION PETROLEUM DEMAND

Source	CO_2 (Metric Tons)	kg/CO_2/Gallon	Gallons
DIESEL			
Equipment	484.3	10.21	47,432.1
Trucks	391.0	10.21	38,295.3
		Total Diesel Consumption	***85,727.4***
GASOLINE			
Worker Vehicles	1,029.6	8.78	117,266.2
SOURCE: The Climate Registry, 2018; TAHA, 2021.			

Operation. Petroleum consumption during operation of the proposed project would be related to vehicle trips. A transportation analysis completed for the proposed project estimated that the clinic would generate 564 daily trips. The clinic would support the future academic success and vitality of the CSULB by:

- Increasing the number student clinical placements allowing high impact clinical degree programs to increase the number of admitted students.
- Strengthening the tie between clinical care and education that deeply enriches all clinical and allied health degree programs and inspires mutually beneficial innovation in both education and patient care.
- Providing faculty workload that includes clinical practice supports their licensure requirements, enhances their ability to teach clinical concepts and skills, and pays them a salary that more closely approximates what they would be paid as a clinician and thus, mitigates long-standing challenges with clinical faculty recruitment.
- Allowing collaboration that will lead to high impact research findings that will have implications for immediate translation and uptake in clinical care and education practices.

The gasoline use associated with the clinic operations is not considered a wasteful, inefficient, or unnecessary consumption of petroleum in consideration of the community and CSULB benefits provided by the clinic . Therefore, operation of the proposed project would result in a less than significant impact related to consumption of petroleum.

Mitigation Measures

No mitigation measures are required.

b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency? (Less-than-Significant Impact)

Due to their age, the existing buildings are inefficient and use outdated lighting, heating, and cooling technologies that do not comply with current energy use and efficiency requirements of Title 24, Part 6, of the California Code of Regulations. The replacement building would incorporate energy-efficiency, sustainability, water- and waste-efficiency, and resiliency features to achieve an NZE Rating and a LEED Gold, or better, building Rating. The building envelope would be configured to maximize daylighting and exterior views. Existing building-serving utilities, including storm drain, electrical, heating, cooling, water, and wastewater, would be removed and replaced to appropriately serve the new building. The proposed project would exceed Title 24, Part 6, of the California Code of Regulations in accordance with CSULB sustainability plans.

The CSU sustainability[10] and energy[11] policies apply sustainable principles across all areas of university operations, including facility sustainability improvements, energy and water efficiency retrofits, and incorporation of green building practices into new facility design.

In accordance with the CSU and campus energy and sustainability goals and polices, it is the University's goal for the proposed project to be NZE building with an annual delivered energy that is greater than or equal to the combination of on-site and campus wide renewable energy. The expectation is to achieve these goals by designing an efficient building focused on load reductions, efficient systems, regeneration/reuse and renewable systems. In order to achieve a NZE goal, the EUI target range would be between 35-45 kBTU/SF. This EUI

[10]CSU Sustainability Policy, Board of Trustees Meeting, March 23, 2022.

[11]CSU Policy Statement on Energy Conversation, Sustainable Building Practices, and Physical Plant Management for the California State University, EO 987; https://calstate.policystat.com/policy/6589455/latest/

target allows most low-rise projects to accommodate on-site PV on the roof. Note that the existing 4.8 MW solar installation in parking lots G6-G8 may be used for this project to offset building energy use. The extent of such use would be determined during design to optimize the size of building PV systems in conjunction with the use of existing campus PV arrays to best-meet the zero-net energy project intent and goals. Additional sustainability features include waste recycling, ultra-low flow/low-flush fixtures, and energy efficient mechanical systems and lighting systems. Each of these features contributes to increased energy efficiency and ensure that the proposed project would not conflict with or obstruct adopted campus and CSU energy plans or state policies or regulations. The proposed project would incorporate sustainable design features that would be consistent with CSU sustainability policies adopted after the 2008 EIR was prepared. Therefore, the proposed project would result in a less than significant impact related to energy plans.

Mitigation Measures

No mitigation measures are required.

References

California Energy Commission, *Energy Almanac*, available at https://www.energy.ca.gov/data-reports/energy-almanac, accessed December 7, 2021.

California Gas and Electric Utilities, 2020 California Gas Report, 2020.

California Gas and Electric Utilities, 2021 Supplemental California Gas Report, 2021.

CSU Board of Trustees, *Sustainability Policy*, March 23, 2022.

CSU Board of Trustees, *Policy Statement on Energy Conversation, Sustainable Building Practices, and Physical Plant Management for the California State University*, EO 987.

Southern California Edison, *2019 Power Content Label*, October 2020.

U.S Energy Information Administration, California State Electricity Profile 2020, Table 3: Top Five Retailers of Electricity with End Use Sectors, November 4, 2021.

U.S. Energy Information Administration, *California Natural Gas Consumption by End Use*, November 30, 2021.

U.S. Energy Information Administration, *California State Electricity Profile 2020*, November 4, 2021.

U.S. Energy Information Administration, *California State Energy Profile*, November 18, 2021.

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

CSULB Peterson Hall 1 Replacement 2020-100

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Library	137.07	1000sqft	3.15	137,072.00	0
Parking Lot	45.00	Space	0.41	18,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2025
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Construction of new 137,072 gross square feet, three-story building with 45 space parking lot

Construction Phase - Demolition: 2 months, Site Prep: 2 months, Grading: 2 months, Trenching: 2 months, Building Construction: 13 months, Paving 1.5 months, Architectural coating: 2 months

Off-road Equipment - Conservative estimate

Off-road Equipment - From construction data list

Off-road Equipment - From construction data list

Off-road Equipment - Construction data list

Off-road Equipment - From construction data list

Off-road Equipment - From construction data list

Off-road Equipment - From construction data list

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Trips and VMT - From construction data list/PD. Conservative estimates. Haul trips during demo and grading represent the maximum daily trips during phases.

Demolition -

Grading -

Architectural Coating - SCAQMD Rule 1113 = 50g/L for building envelope coatings

Vehicle Trips - Project would generate an estimated 564 daily trips

Area Coating - SCAQMD Rule 1113

Construction Off-road Equipment Mitigation - SCAQMD Rule 403

Mobile Land Use Mitigation -

Area Mitigation - SCAQMD Rule 1113

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	50.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	100	50
tblConstructionPhase	NumDays	18.00	45.00
tblConstructionPhase	NumDays	230.00	280.00
tblConstructionPhase	NumDays	20.00	45.00
tblConstructionPhase	NumDays	8.00	45.00
tblConstructionPhase	NumDays	18.00	35.00
tblConstructionPhase	NumDays	5.00	45.00
tblGrading	MaterialExported	0.00	4,000.00
tblLandUse	LandUseSquareFeet	137,070.00	137,072.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	7.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblTripsAndVMT	HaulingTripNumber	105.00	3,240.00
tblTripsAndVMT	HaulingTripNumber	500.00	800.00
tblTripsAndVMT	VendorTripNumber	25.00	104.00
tblTripsAndVMT	VendorTripNumber	0.00	30.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	WorkerTripNumber	13.00	100.00
tblTripsAndVMT	WorkerTripNumber	8.00	100.00
tblTripsAndVMT	WorkerTripNumber	8.00	100.00
tblTripsAndVMT	WorkerTripNumber	13.00	100.00
tblTripsAndVMT	WorkerTripNumber	65.00	770.00
tblTripsAndVMT	WorkerTripNumber	13.00	100.00
tblTripsAndVMT	WorkerTripNumber	13.00	100.00
tblVehicleTrips	ST_TR	80.09	4.12

tblVehicleTrips	SU_TR	42.09	4.12
tblVehicleTrips	WD_TR	72.05	4.12

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	1.9626	24.3745	19.3306	0.0757	7.3814	0.7428	7.8955	3.3003	0.6958	3.7733	0.0000	7,915.6526	7,915.6526	0.8693	0.7602	8,163.9343
2024	4.0092	16.9471	37.9724	0.1113	9.2730	0.6457	9.7937	3.3003	0.5940	3.7499	0.0000	11,291.5675	11,291.5675	0.5918	0.4725	11,446.9154
2025	25.5215	16.1042	36.2580	0.1085	9.2730	0.4604	9.7333	2.4744	0.4418	2.9161	0.0000	11,078.6896	11,078.6896	0.5581	0.4557	11,228.4411
Maximum	**25.5215**	**24.3745**	**37.9724**	**0.1113**	**9.2730**	**0.7428**	**9.7937**	**3.3003**	**0.6958**	**3.7733**	**0.0000**	**11,291.5675**	**11,291.5675**	**0.8693**	**0.7602**	**11,446.9154**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	1.9626	24.3745	19.3306	0.0757	3.5606	0.7428	4.0747	1.4679	0.6958	1.9409	0.0000	7,915.6526	7,915.6526	0.8693	0.7602	8,163.9343
2024	4.0092	16.9471	37.9724	0.1113	9.2730	0.6457	9.7937	2.4744	0.5940	2.9744	0.0000	11,291.5675	11,291.5675	0.5918	0.4725	11,446.9154
2025	25.5215	16.1042	36.2580	0.1085	9.2730	0.4604	9.7333	2.4744	0.4418	2.9161	0.0000	11,078.6896	11,078.6896	0.5581	0.4557	11,228.4411
Maximum	**25.5215**	**24.3745**	**37.9724**	**0.1113**	**9.2730**	**0.7428**	**9.7937**	**2.4744**	**0.6958**	**2.9744**	**0.0000**	**11,291.5675**	**11,291.5675**	**0.8693**	**0.7602**	**11,446.9154**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	14.74	0.00	13.93	29.29	0.00	24.98	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.0281	1.7000e-004	0.0185	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0399	0.0399	1.0000e-004		0.0424
Energy	0.0727	0.6612	0.5555	3.9700e-003		0.0503	0.0503		0.0503	0.0503		793.4934	793.4934	0.0152	0.0146	798.2087
Mobile	1.3867	1.4034	12.8831	0.0268	3.0020	0.0203	3.0223	0.7997	0.0189	0.8185		2,806.4507	2,806.4507	0.2057	0.1262	2,849.2049
Total	**4.4875**	**2.0648**	**13.4571**	**0.0308**	**3.0020**	**0.0706**	**3.0726**	**0.7997**	**0.0692**	**0.8689**		**3,599.9839**	**3,599.9839**	**0.2210**	**0.1408**	**3,647.4560**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	3.0281	1.7000e-004	0.0185	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0399	0.0399	1.0000e-004		0.0424
Energy	0.0727	0.6612	0.5555	3.9700e-003		0.0503	0.0503		0.0503	0.0503		793.4934	793.4934	0.0152	0.0146	798.2087
Mobile	1.3867	1.4034	12.8831	0.0268	3.0020	0.0203	3.0223	0.7997	0.0189	0.8185		2,806.4507	2,806.4507	0.2057	0.1262	2,849.2049
Total	**4.4875**	**2.0648**	**13.4571**	**0.0308**	**3.0020**	**0.0706**	**3.0726**	**0.7997**	**0.0692**	**0.8689**		**3,599.9839**	**3,599.9839**	**0.2210**	**0.1408**	**3,647.4560**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/4/2023	11/3/2023	5	45	
2	Site Preparation	Site Preparation	11/6/2023	1/5/2024	5	45	
3	Grading	Grading	1/8/2024	3/8/2024	5	45	
4	Trenching	Trenching	3/11/2024	5/10/2024	5	45	
5	Building Construction	Building Construction	5/13/2024	6/6/2025	5	280	
6	Paving	Paving	6/9/2025	7/25/2025	5	35	
7	Architectural Coating	Architectural Coating	7/28/2025	9/26/2025	5	45	

Acres of Grading (Site Preparation Phase): 42.19

Acres of Grading (Grading Phase): 33.75

Acres of Paving: 0.41

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 205,608; Non-Residential Outdoor: 68,536; Striped Parking Area: 1,080 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41

Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching	Trenchers	2	8.00	78	0.50
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Aerial Lifts	2	6.00	63	0.31
Architectural Coating	Air Compressors	2	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	100.00	0.00	3,240.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	100.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	100.00	0.00	800.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	5	100.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

Building Construction	7	770.00	104.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	100.00	30.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	4	100.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5041	0.0000	0.5041	0.0763	0.0000	0.0763			0.0000			0.0000
Off-Road	1.4725	14.3184	13.4577	0.0241		0.6766	0.6766		0.6328	0.6328		2,324.3959	2,324.3959	0.5893		2,339.1278
Total	**1.4725**	**14.3184**	**13.4577**	**0.0241**	**0.5041**	**0.6766**	**1.1807**	**0.0763**	**0.6328**	**0.7091**		**2,324.3959**	**2,324.3959**	**0.5893**		**2,339.1278**

3.2 Demolition - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1461	9.8095	2.5421	0.0422	1.2603	0.0594	1.3197	0.3455	0.0569	0.4024		4,632.0300	4,632.0300	0.2545	0.7356	4,857.5943
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
Worker	0.3441	0.2466	3.3308	9.3700e-003	1.1178	6.7400e-003	1.1245	0.2964	6.2100e-003	0.3027		959.2267	959.2267	0.0256	0.0247	967.2121
Total	**0.4901**	**10.0561**	**5.8729**	**0.0515**	**2.3781**	**0.0662**	**2.4442**	**0.6420**	**0.0631**	**0.7050**		**5,591.2567**	**5,591.2567**	**0.2800**	**0.7602**	**5,824.8065**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1966	0.0000	0.1966	0.0298	0.0000	0.0298			0.0000			0.0000
Off-Road	1.4725	14.3184	13.4577	0.0241		0.6766	0.6766		0.6328	0.6328	0.0000	2,324.3959	2,324.3959	0.5893		2,339.1278
Total	**1.4725**	**14.3184**	**13.4577**	**0.0241**	**0.1966**	**0.6766**	**0.8732**	**0.0298**	**0.6328**	**0.6625**	**0.0000**	**2,324.3959**	**2,324.3959**	**0.5893**		**2,339.1278**

3.2 Demolition - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1461	9.8095	2.5421	0.0422	1.2603	0.0594	1.3197	0.3455	0.0569	0.4024		4,632.030 0	4,632.030 0	0.2545	0.7356	4,857.594 3
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
Worker	0.3441	0.2466	3.3308	9.3700e-003	1.1178	6.7400e-003	1.1245	0.2964	6.2100e-003	0.3027		959.2267	959.2267	0.0256	0.0247	967.2121
Total	**0.4901**	**10.0561**	**5.8729**	**0.0515**	**2.3781**	**0.0662**	**2.4442**	**0.6420**	**0.0631**	**0.7050**		**5,591.256 7**	**5,591.256 7**	**0.2800**	**0.7602**	**5,824.806 5**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2636	0.0000	6.2636	3.0038	0.0000	3.0038			0.0000			0.0000
Off-Road	1.1339	12.4250	6.6420	0.0172		0.5074	0.5074		0.4668	0.4668		1,666.057 3	1,666.057 3	0.5388		1,679.528 2
Total	**1.1339**	**12.4250**	**6.6420**	**0.0172**	**6.2636**	**0.5074**	**6.7710**	**3.0038**	**0.4668**	**3.4706**		**1,666.057 3**	**1,666.057 3**	**0.5388**		**1,679.528 2**

3.3 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker	0.3441	0.2466	3.3308	9.3700e-003	1.1178	6.7400e-003	1.1245	0.2964	6.2100e-003	0.3027		959.2267	959.2267	0.0256	0.0247	967.2121
Total	**0.3441**	**0.2466**	**3.3308**	**9.3700e-003**	**1.1178**	**6.7400e-003**	**1.1245**	**0.2964**	**6.2100e-003**	**0.3027**		**959.2267**	**959.2267**	**0.0256**	**0.0247**	**967.2121**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4428	0.0000	2.4428	1.1715	0.0000	1.1715			0.0000			0.0000
Off-Road	1.1339	12.4250	6.6420	0.0172		0.5074	0.5074		0.4668	0.4668	0.0000	1,666.0573	1,666.0573	0.5388		1,679.5282
Total	**1.1339**	**12.4250**	**6.6420**	**0.0172**	**2.4428**	**0.5074**	**2.9502**	**1.1715**	**0.4668**	**1.6383**	**0.0000**	**1,666.0573**	**1,666.0573**	**0.5388**		**1,679.5282**

3.3 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker	0.3441	0.2466	3.3308	9.3700e-003	1.1178	6.7400e-003	1.1245	0.2964	6.2100e-003	0.3027		959.2267	959.2267	0.0256	0.0247	967.2121
Total	**0.3441**	**0.2466**	**3.3308**	**9.3700e-003**	**1.1178**	**6.7400e-003**	**1.1245**	**0.2964**	**6.2100e-003**	**0.3027**		**959.2267**	**959.2267**	**0.0256**	**0.0247**	**967.2121**

3.3 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.2636	0.0000	6.2636	3.0038	0.0000	3.0038			0.0000			0.0000
Off-Road	1.1067	11.8407	6.6317	0.0172		0.4823	0.4823		0.4437	0.4437		1,665.8826	1,665.8826	0.5388		1,679.3521
Total	**1.1067**	**11.8407**	**6.6317**	**0.0172**	**6.2636**	**0.4823**	**6.7459**	**3.0038**	**0.4437**	**3.4475**		**1,665.8826**	**1,665.8826**	**0.5388**		**1,679.3521**

3.3 Site Preparation - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker	0.3217	0.2202	3.1031	9.1100e-003	1.1178	6.4700e-003	1.1242	0.2964	5.9500e-003	0.3024		939.5399	939.5399	0.0232	0.0229	946.9482
Total	**0.3217**	**0.2202**	**3.1031**	**9.1100e-003**	**1.1178**	**6.4700e-003**	**1.1242**	**0.2964**	**5.9500e-003**	**0.3024**		**939.5399**	**939.5399**	**0.0232**	**0.0229**	**946.9482**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4428	0.0000	2.4428	1.1715	0.0000	1.1715			0.0000			0.0000
Off-Road	1.1067	11.8407	6.6317	0.0172		0.4823	0.4823		0.4437	0.4437	0.0000	1,665.8826	1,665.8826	0.5388		1,679.3521
Total	**1.1067**	**11.8407**	**6.6317**	**0.0172**	**2.4428**	**0.4823**	**2.9251**	**1.1715**	**0.4437**	**1.6152**	**0.0000**	**1,665.8826**	**1,665.8826**	**0.5388**		**1,679.3521**

3.3 Site Preparation - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker	0.3217	0.2202	3.1031	9.1100e-003	1.1178	6.4700e-003	1.1242	0.2964	5.9500e-003	0.3024		939.5399	939.5399	0.0232	0.0229	946.9482
Total	**0.3217**	**0.2202**	**3.1031**	**9.1100e-003**	**1.1178**	**6.4700e-003**	**1.1242**	**0.2964**	**5.9500e-003**	**0.3024**		**939.5399**	**939.5399**	**0.0232**	**0.0229**	**946.9482**

3.4 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.3220	0.0000	5.3220	2.5701	0.0000	2.5701			0.0000			0.0000
Off-Road	0.9132	9.7297	5.5468	0.0141		0.4001	0.4001		0.3681	0.3681		1,364.6623	1,364.6623	0.4414		1,375.6962
Total	**0.9132**	**9.7297**	**5.5468**	**0.0141**	**5.3220**	**0.4001**	**5.7221**	**2.5701**	**0.3681**	**2.9382**		**1,364.6623**	**1,364.6623**	**0.4414**		**1,375.6962**

3.4 Grading - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0358	2.4284	0.6386	0.0103	0.3112	0.0148	0.3260	0.0853	0.0142	0.0995		1,127.5315	1,127.5315	0.0634	0.1791	1,182.4950
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
Worker	0.3217	0.2202	3.1031	9.1100e-003	1.1178	6.4700e-003	1.1242	0.2964	5.9500e-003	0.3024		939.5399	939.5399	0.0232	0.0229	946.9482
Total	**0.3576**	**2.6486**	**3.7416**	**0.0194**	**1.4290**	**0.0213**	**1.4502**	**0.3818**	**0.0201**	**0.4019**		**2,067.0714**	**2,067.0714**	**0.0866**	**0.2020**	**2,129.4431**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.0756	0.0000	2.0756	1.0023	0.0000	1.0023			0.0000			0.0000
Off-Road	0.9132	9.7297	5.5468	0.0141		0.4001	0.4001		0.3681	0.3681	0.0000	1,364.6623	1,364.6623	0.4414		1,375.6962
Total	**0.9132**	**9.7297**	**5.5468**	**0.0141**	**2.0756**	**0.4001**	**2.4757**	**1.0023**	**0.3681**	**1.3704**	**0.0000**	**1,364.6623**	**1,364.6623**	**0.4414**		**1,375.6962**

3.4 Grading - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0358	2.4284	0.6386	0.0103	0.3112	0.0148	0.3260	0.0853	0.0142	0.0995		1,127.5315	1,127.5315	0.0634	0.1791	1,182.4950
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
Worker	0.3217	0.2202	3.1031	9.1100e-003	1.1178	6.4700e-003	1.1242	0.2964	5.9500e-003	0.3024		939.5399	939.5399	0.0232	0.0229	946.9482
Total	**0.3576**	**2.6486**	**3.7416**	**0.0194**	**1.4290**	**0.0213**	**1.4502**	**0.3818**	**0.0201**	**0.4019**		**2,067.0714**	**2,067.0714**	**0.0866**	**0.2020**	**2,129.4431**

3.5 Trenching - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1481	10.6181	12.9206	0.0182		0.6392	0.6392		0.5881	0.5881		1,758.1190	1,758.1190	0.5686		1,772.3342
Total	**1.1481**	**10.6181**	**12.9206**	**0.0182**		**0.6392**	**0.6392**		**0.5881**	**0.5881**		**1,758.1190**	**1,758.1190**	**0.5686**		**1,772.3342**

3.5 Trenching - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker	0.3217	0.2202	3.1031	9.1100e-003	1.1178	6.4700e-003	1.1242	0.2964	5.9500e-003	0.3024		939.5399	939.5399	0.0232	0.0229	946.9482
Total	**0.3217**	**0.2202**	**3.1031**	**9.1100e-003**	**1.1178**	**6.4700e-003**	**1.1242**	**0.2964**	**5.9500e-003**	**0.3024**		**939.5399**	**939.5399**	**0.0232**	**0.0229**	**946.9482**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1481	10.6181	12.9206	0.0182		0.6392	0.6392		0.5881	0.5881	0.0000	1,758.1190	1,758.1190	0.5686		1,772.3342
Total	**1.1481**	**10.6181**	**12.9206**	**0.0182**		**0.6392**	**0.6392**		**0.5881**	**0.5881**	**0.0000**	**1,758.1190**	**1,758.1190**	**0.5686**		**1,772.3342**

3.5 Trenching - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
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
Worker	0.3217	0.2202	3.1031	9.1100e-003	1.1178	6.4700e-003	1.1242	0.2964	5.9500e-003	0.3024		939.5399	939.5399	0.0232	0.0229	946.9482
Total	**0.3217**	**0.2202**	**3.1031**	**9.1100e-003**	**1.1178**	**6.4700e-003**	**1.1242**	**0.2964**	**5.9500e-003**	**0.3024**		**939.5399**	**939.5399**	**0.0232**	**0.0229**	**946.9482**

3.6 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4200	11.0639	12.5172	0.0221		0.4506	0.4506		0.4348	0.4348		2,001.9214	2,001.9214	0.3334		2,010.2563
Total	**1.4200**	**11.0639**	**12.5172**	**0.0221**		**0.4506**	**0.4506**		**0.4348**	**0.4348**		**2,001.9214**	**2,001.9214**	**0.3334**		**2,010.2563**

3.6 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1118	4.1880	1.5616	0.0191	0.6662	0.0203	0.6865	0.1918	0.0194	0.2113		2,055.1891	2,055.1891	0.0697	0.2961	2,145.1584
Worker	2.4774	1.6953	23.8937	0.0701	8.6068	0.0498	8.6566	2.2826	0.0459	2.3284		7,234.4570	7,234.4570	0.1783	0.1765	7,291.5008
Total	**2.5892**	**5.8833**	**25.4553**	**0.0892**	**9.2730**	**0.0701**	**9.3431**	**2.4744**	**0.0653**	**2.5397**		**9,289.6461**	**9,289.6461**	**0.2480**	**0.4725**	**9,436.6592**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4200	11.0639	12.5172	0.0221		0.4506	0.4506		0.4348	0.4348	0.0000	2,001.9214	2,001.9214	0.3334		2,010.2563
Total	**1.4200**	**11.0639**	**12.5172**	**0.0221**		**0.4506**	**0.4506**		**0.4348**	**0.4348**	**0.0000**	**2,001.9214**	**2,001.9214**	**0.3334**		**2,010.2563**

3.6 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1118	4.1880	1.5616	0.0191	0.6662	0.0203	0.6865	0.1918	0.0194	0.2113		2,055.189 1	2,055.189 1	0.0697	0.2961	2,145.158 4
Worker	2.4774	1.6953	23.8937	0.0701	8.6068	0.0498	8.6566	2.2826	0.0459	2.3284		7,234.457 0	7,234.457 0	0.1783	0.1765	7,291.500 8
Total	**2.5892**	**5.8833**	**25.4553**	**0.0892**	**9.2730**	**0.0701**	**9.3431**	**2.4744**	**0.0653**	**2.5397**		**9,289.646 1**	**9,289.646 1**	**0.2480**	**0.4725**	**9,436.659 2**

3.6 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3246	10.4128	12.4393	0.0221		0.3925	0.3925		0.3785	0.3785		2,002.152 4	2,002.152 4	0.3269		2,010.324 8
Total	**1.3246**	**10.4128**	**12.4393**	**0.0221**		**0.3925**	**0.3925**		**0.3785**	**0.3785**		**2,002.152 4**	**2,002.152 4**	**0.3269**		**2,010.324 8**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.6 Building Construction - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1084	4.1685	1.5333	0.0187	0.6662	0.0204	0.6866	0.1918	0.0195	0.2113		2,018.249 8	2,018.249 8	0.0702	0.2909	2,106.702 4
Worker	2.3249	1.5229	22.2854	0.0678	8.6068	0.0475	8.6543	2.2826	0.0437	2.3263		7,058.287 3	7,058.287 3	0.1610	0.1648	7,111.413 9
Total	**2.4332**	**5.6914**	**23.8187**	**0.0865**	**9.2730**	**0.0679**	**9.3409**	**2.4744**	**0.0632**	**2.5376**		**9,076.537 1**	**9,076.537 1**	**0.2312**	**0.4557**	**9,218.116 4**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3246	10.4128	12.4393	0.0221		0.3925	0.3925		0.3785	0.3785	0.0000	2,002.152 4	2,002.152 4	0.3269		2,010.324 8
Total	**1.3246**	**10.4128**	**12.4393**	**0.0221**		**0.3925**	**0.3925**		**0.3785**	**0.3785**	**0.0000**	**2,002.152 4**	**2,002.152 4**	**0.3269**		**2,010.324 8**

3.6 Building Construction - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1084	4.1685	1.5333	0.0187	0.6662	0.0204	0.6866	0.1918	0.0195	0.2113		2,018.2498	2,018.2498	0.0702	0.2909	2,106.7024
Worker	2.3249	1.5229	22.2854	0.0678	8.6068	0.0475	8.6543	2.2826	0.0437	2.3263		7,058.2873	7,058.2873	0.1610	0.1648	7,111.4139
Total	**2.4332**	**5.6914**	**23.8187**	**0.0865**	**9.2730**	**0.0679**	**9.3409**	**2.4744**	**0.0632**	**2.5376**		**9,076.5371**	**9,076.5371**	**0.2312**	**0.4557**	**9,218.1164**

3.7 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5732	5.3259	8.7951	0.0136		0.2465	0.2465		0.2276	0.2276		1,297.8096	1,297.8096	0.4114		1,308.0951
Paving	0.0307					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6039**	**5.3259**	**8.7951**	**0.0136**		**0.2465**	**0.2465**		**0.2276**	**0.2276**		**1,297.8096**	**1,297.8096**	**0.4114**		**1,308.0951**

3.7 Paving - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0313	1.2024	0.4423	5.4000e-003	0.1922	5.8800e-003	0.1981	0.0553	5.6200e-003	0.0610		582.1875	582.1875	0.0203	0.0839	607.7026
Worker	0.3019	0.1978	2.8942	8.8000e-003	1.1178	6.1700e-003	1.1239	0.2964	5.6800e-003	0.3021		916.6607	916.6607	0.0209	0.0214	923.5603
Total	**0.3332**	**1.4002**	**3.3365**	**0.0142**	**1.3099**	**0.0121**	**1.3220**	**0.3518**	**0.0113**	**0.3631**		**1,498.8481**	**1,498.8481**	**0.0412**	**0.1053**	**1,531.2629**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5732	5.3259	8.7951	0.0136		0.2465	0.2465		0.2276	0.2276	0.0000	1,297.8096	1,297.8096	0.4114		1,308.0951
Paving	0.0307					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6039**	**5.3259**	**8.7951**	**0.0136**		**0.2465**	**0.2465**		**0.2276**	**0.2276**	**0.0000**	**1,297.8096**	**1,297.8096**	**0.4114**		**1,308.0951**

3.7 Paving - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0313	1.2024	0.4423	5.4000e-003	0.1922	5.8800e-003	0.1981	0.0553	5.6200e-003	0.0610		582.1875	582.1875	0.0203	0.0839	607.7026
Worker	0.3019	0.1978	2.8942	8.8000e-003	1.1178	6.1700e-003	1.1239	0.2964	5.6800e-003	0.3021		916.6607	916.6607	0.0209	0.0214	923.5603
Total	**0.3332**	**1.4002**	**3.3365**	**0.0142**	**1.3099**	**0.0121**	**1.3220**	**0.3518**	**0.0113**	**0.3631**		**1,498.8481**	**1,498.8481**	**0.0412**	**0.1053**	**1,531.2629**

3.8 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	24.8185					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3928	3.0716	5.2548	8.4600e-003		0.1164	0.1164		0.1153	0.1153		806.8259	806.8259	0.1096		809.5658
Total	**25.2112**	**3.0716**	**5.2548**	**8.4600e-003**		**0.1164**	**0.1164**		**0.1153**	**0.1153**		**806.8259**	**806.8259**	**0.1096**		**809.5658**

3.8 Architectural Coating - 2025

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.3400e-003	0.3207	0.1179	1.4400e-003	0.0512	1.5700e-003	0.0528	0.0148	1.5000e-003	0.0163		155.2500	155.2500	5.4000e-003	0.0224	162.0540
Worker	0.3019	0.1978	2.8942	8.8000e-003	1.1178	6.1700e-003	1.1239	0.2964	5.6800e-003	0.3021		916.6607	916.6607	0.0209	0.0214	923.5603
Total	**0.3103**	**0.5184**	**3.0122**	**0.0102**	**1.1690**	**7.7400e-003**	**1.1768**	**0.3112**	**7.1800e-003**	**0.3184**		**1,071.9107**	**1,071.9107**	**0.0263**	**0.0438**	**1,085.6143**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	24.8185					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3928	3.0716	5.2548	8.4600e-003		0.1164	0.1164		0.1153	0.1153	0.0000	806.8259	806.8259	0.1096		809.5658
Total	**25.2112**	**3.0716**	**5.2548**	**8.4600e-003**		**0.1164**	**0.1164**		**0.1153**	**0.1153**	**0.0000**	**806.8259**	**806.8259**	**0.1096**		**809.5658**

3.8 Architectural Coating - 2025

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.3400e-003	0.3207	0.1179	1.4400e-003	0.0512	1.5700e-003	0.0528	0.0148	1.5000e-003	0.0163		155.2500	155.2500	5.4000e-003	0.0224	162.0540
Worker	0.3019	0.1978	2.8942	8.8000e-003	1.1178	6.1700e-003	1.1239	0.2964	5.6800e-003	0.3021		916.6607	916.6607	0.0209	0.0214	923.5603
Total	**0.3103**	**0.5184**	**3.0122**	**0.0102**	**1.1690**	**7.7400e-003**	**1.1768**	**0.3112**	**7.1800e-003**	**0.3184**		**1,071.9107**	**1,071.9107**	**0.0263**	**0.0438**	**1,085.6143**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.3867	1.4034	12.8831	0.0268	3.0020	0.0203	3.0223	0.7997	0.0189	0.8185		2,806.4507	2,806.4507	0.2057	0.1262	2,849.2049
Unmitigated	1.3867	1.4034	12.8831	0.0268	3.0020	0.0203	3.0223	0.7997	0.0189	0.8185		2,806.4507	2,806.4507	0.2057	0.1262	2,849.2049

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Library	564.73	564.73	564.73	1,425,762	1,425,762
Parking Lot	0.00	0.00	0.00		
Total	564.73	564.73	564.73	1,425,762	1,425,762

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Library	16.60	8.40	6.90	52.00	43.00	5.00	44	44	12
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Library	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335
Parking Lot	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0727	0.6612	0.5555	3.9700e-003		0.0503	0.0503		0.0503	0.0503		793.4934	793.4934	0.0152	0.0146	798.2087
NaturalGas Unmitigated	0.0727	0.6612	0.5555	3.9700e-003		0.0503	0.0503		0.0503	0.0503		793.4934	793.4934	0.0152	0.0146	798.2087

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Library	6744.69	0.0727	0.6612	0.5555	3.9700e-003		0.0503	0.0503		0.0503	0.0503		793.4934	793.4934	0.0152	0.0146	798.2087
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0727**	**0.6612**	**0.5555**	**3.9700e-003**		**0.0503**	**0.0503**		**0.0503**	**0.0503**		**793.4934**	**793.4934**	**0.0152**	**0.0146**	**798.2087**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Library	6.74469	0.0727	0.6612	0.5555	3.9700e-003		0.0503	0.0503		0.0503	0.0503		793.4934	793.4934	0.0152	0.0146	798.2087
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0727**	**0.6612**	**0.5555**	**3.9700e-003**		**0.0503**	**0.0503**		**0.0503**	**0.0503**		**793.4934**	**793.4934**	**0.0152**	**0.0146**	**798.2087**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.0281	1.7000e-004	0.0185	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0399	0.0399	1.0000e-004		0.0424
Unmitigated	3.0281	1.7000e-004	0.0185	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0399	0.0399	1.0000e-004		0.0424

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3060					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.7204					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.7100e-003	1.7000e-004	0.0185	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0399	0.0399	1.0000e-004		0.0424
Total	**3.0281**	**1.7000e-004**	**0.0185**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0399**	**0.0399**	**1.0000e-004**		**0.0424**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.3060					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.7204					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.7100e-003	1.7000e-004	0.0185	0.0000		7.0000e-005	7.0000e-005		7.0000e-005	7.0000e-005		0.0399	0.0399	1.0000e-004		0.0424
Total	**3.0281**	**1.7000e-004**	**0.0185**	**0.0000**		**7.0000e-005**	**7.0000e-005**		**7.0000e-005**	**7.0000e-005**		**0.0399**	**0.0399**	**1.0000e-004**		**0.0424**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX D

Greenhouse Gas Emissions Assessment

Technical Memorandum

TO: Jane Chang
AECOM Technical Services Inc.

FROM: Terry A. Hayes Associates Inc.

DATE: May 18, 2022

RE: California State University, Long Beach (CSULB) Peterson Hall 1 Replacement Project – Greenhouse Gas (GHG) Emissions Assessment

Introduction

This GHG Assessment for the CSULB Peterson Hall 1 Replacement Project (proposed project) analyzes the potential environmental impacts associated with the implementation of the Peterson Hall 1 Replacement Building Project (proposed project) on the CSULB campus. The existing Peterson Hall 1 (PH1) building was proposed for demolition and replacement in the Campus Master Plan and Campus Master Plan Update EIR (State Clearinghouse #2007061092), certified by the CSU Board of Trustees in May 2008 (2008 EIR). CSULB now proposes to implement this project with modifications compared to its original description in the 2008 Campus Master Plan, necessitating the preparation of additional environmental analysis and documentation in conformance with the California Environmental Quality Act (CEQA) Guidelines. GHG emissions were not analyzed in the 2008 EIR.

Terry A. Hayes Associates Inc. (TAHA) has completed an GHG Assessment for the proposed project in accordance with provisions of CEQA Statutes and Guidelines. This Assessment is organized as follows:

- Project Description
- Climate Change Topical Background
- Existing Setting
- Regulatory Framework
- Significance Thresholds
- Methodology
- Impact Analysis
- References

Project Description

The proposed project is located in the City of Long Beach, California, specifically within the California State University, Long Beach (CSULB) property. **Figure 1** shows the project location in the City of Long Beach, **Figure 2** shows the location of the proposed project within the CSULB boundary, and **Figure 3** shows the conceptual site plan of the proposed project.

Source: Esri, 2021.

Figure 1

Regional Map

Source: bing, 2021.

Figure 2

Project Location Map

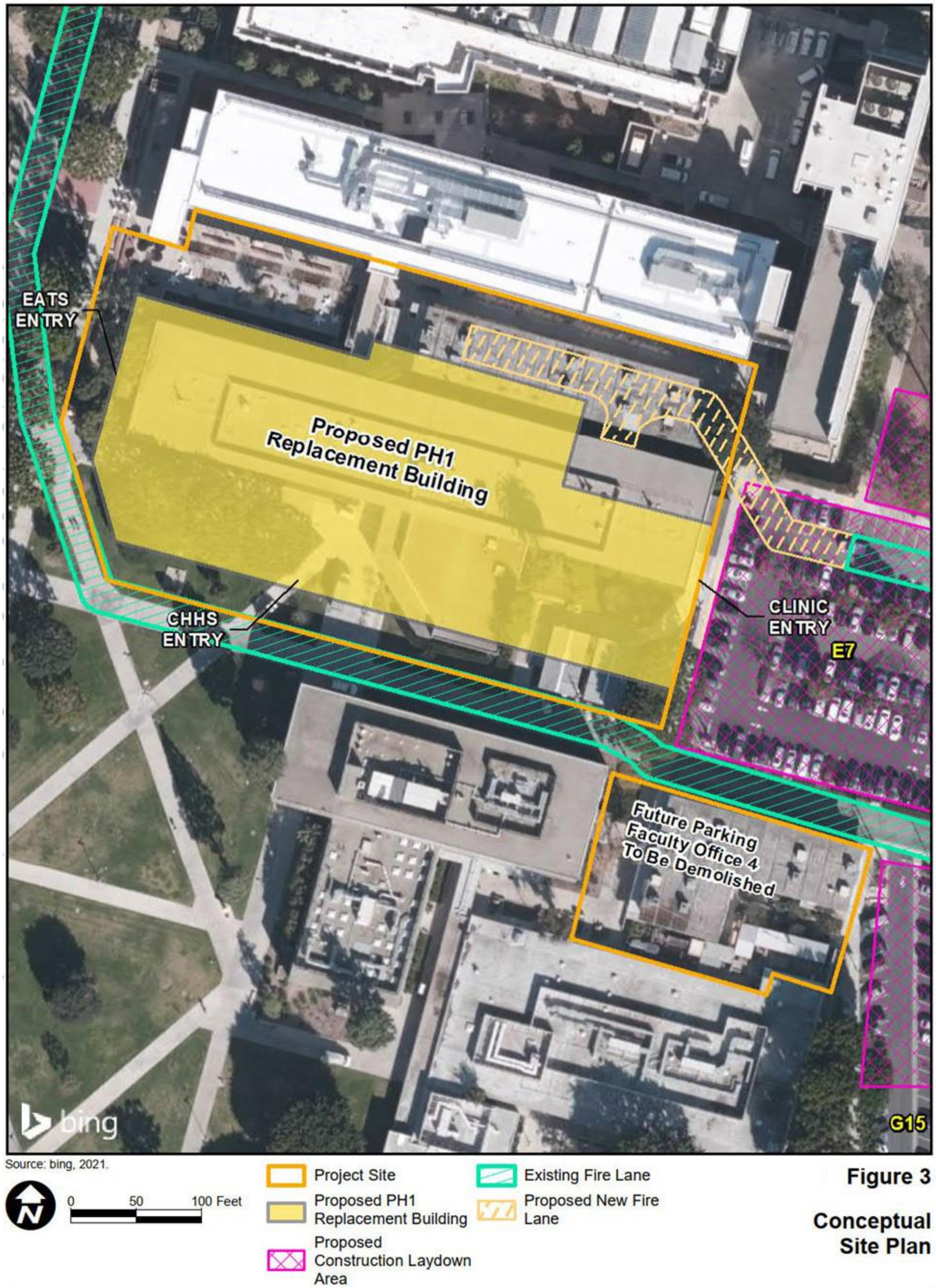

Figure 3

Conceptual Site Plan

The existing Peterson Hall 1 (PH1) building was proposed for demolition and replacement in the Campus Master Plan and Campus Master Plan Update EIR, certified by the CSU Board of Trustees in May 2008 (2008 EIR). CSULB now proposes to implement this project with modifications compared to its original description in the 2008 Campus Master Plan, necessitating the preparation of additional environmental analysis and documentation in conformance with the California Environmental Quality Act (CEQA) Guidelines. All applicable mitigation measures from the 2008 EIR would be applicable to the proposed project.

Similar to the approved project, the current proposed project involves demolition of the existing PH1 building and temporary Faculty Office 5 (FO5) building as well as construction of a new building. In the time since the 2008 EIR, Peterson Hall 2 (PH2) has undergone a renovation, which included a small addition, rather than the originally contemplated replacement of the PH2 building. As such, PH2 would remain in use and is not part of the current proposed project. The 2008 Campus Master Plan proposed two new buildings to accommodate replacement lecture and laboratory space as well as approximately 170 faculty offices. Instead of constructing two new replacement buildings as contemplated in the 2008 EIR, the proposed project would construct one new three-story building. The proposed building would include lecture and lab space, as well as faculty offices, similar to the approved project.

In addition, the proposed project would include uses not originally contemplated in the 2008 EIR, including a public clinic to be operated in cooperation with a local Clinical Healthcare provider partner (clinical partner), under a teaching clinic model. The proposed project would also require demolition of the Faculty Office 4 (FO4) temporary building to accommodate a surface parking lot to serve the clinic, which was not originally contemplated for the approved project.

The proposed project site includes the existing PH1 building, FO4, FO5, and construction laydown and equipment storage areas, and is located in the southern portion of the campus, as shown in **Figure 2**. The proposed project would construct a new 137,072 gross square feet, three-story building for the College of Health and Human Services (CHHS) to replace the existing PH1 building, and the FO4 and FO5 temporary office buildings. The replacement facility would occupy the PH1 and FO5 building footprints. FO4 would become future additional surface parking. The new building would include faculty space, student collaboration space, teaching labs, research labs, administration space, a medical simulation center, and a clinic to be operated in cooperation with a local regional hospital. Office construction would implement the CSULB office space standards of 90 ASF for faculty offices, which would provide the equivalent of 134 new faculty offices. The replacement building would be open to students during normal academic hours as well as evenings and weekends to support academic scheduling and student self-study needs.

The clinic would be based on a “teaching-clinic model” and would be located on the first floor of the replacement building. The clinic would operate Monday through Friday from 8:00 a.m. to 5:00 p.m. and would not have an urgent care component. FO4 would be demolished and replaced with a surface parking lot that would provide approximately 45 new dedicated parking spaces for the clinic, which would be available for use by the campus outside of clinic hours.

Construction of the proposed project is anticipated to take approximately 24 months to complete, commencing in September 2023 and concluding in September 2025. Operations of the proposed project would generate an estimated 564 daily trips, including 52 morning peak hour trips (31 trips entering, 21 trips exiting), and 63 evening peak hour trips (29 trips entering, 34 trips exiting). This overall trip generation includes trips from the clinic staff, clinic patients, CSULB students, and CSULB employees.

Climate Change Topical Background

Climate change refers to variations in average long-term meteorological conditions on Earth as a whole, including changes in temperature, wind patterns, precipitation, and frequency and severity of extreme weather events. Historical records indicate that global climate fluctuations have occurred in the past due to natural phenomena; however, recent data increasingly suggests that the current global conditions are distinct from previous patterns and are influenced by anthropogenic (human-sourced) GHG emissions. GHGs are a class of pollutants that are generally understood to play a critical role in controlling atmospheric temperature near the Earth's surface by allowing high frequency shortwave solar radiation to enter the planet's atmosphere and then subsequently trapping low frequency infrared radiative energy that would otherwise emanate back out into space. The greenhouse effect compares the Earth and the atmosphere surrounding it to a greenhouse with glass panes; the glass panes in a greenhouse let heat from sunlight in and reduce the amount of heat that escapes. The levels of GHGs in the atmosphere affect how much heat energy can be absorbed.

Radiative forcing is an expression of the net difference in energy entering Earth's atmosphere versus leaving it. Each GHG possesses its own degree of climate forcing ability to absorb low frequency infrared energy, meaning that some GHGs are more effective in trapping heat in the atmosphere than others. Water vapor is the most environmentally prevalent GHG, however, definitive methods are not established to regulate emissions and concentrations of water vapor in the atmosphere. After water vapor, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are the most ubiquitous GHGs, and CO_2 is commonly used as the standard reference for characterizing the relative global warming potential (GWP) of other GHGs. The GWP value describes the relative magnitude of climate forcing effects of GHGs and is used to convert emissions into CO_2-equivalents (CO_2e). **Table 1** presents the GWP value and atmospheric lifetime of CO_2, CH_4, and N_2O, as well as other regulated GHGs emitted by human activities. GHG emissions that would be generated by the proposed project are assessed in units of metric tons of CO_2e ($MTCO_2e$).

TABLE 1: GLOBAL WARMING POTENTIAL FOR VARIOUS GREENHOUSE GASES

Pollutant	Lifetime (Years) /a/	Global Warming Potential (20-Year)	Global Warming Potential (100-Year) /b/
Carbon Dioxide (CO_2)	--	1	1
Methane (CH_4)	12	21	25
Nitrous Oxide (N_2O)	114	310	298
Nitrogen Trifluoride	740	Unknown	17,200
Sulfur Hexafluoride (SF_6)	3,200	23,900	22,800
Perfluorocarbons (PFCs)	2,600-50,000	6,500-9,200	7,390-12,200
Hydrofluorocarbons (HFCs)	1-270	140-11,700	124-14,800

/a/ Lifetime refers to the approximate amount of time it would take for the anthropogenic increment to an atmospheric pollutant concentration to return to its natural level as a result of either being converted to another chemical compound or being taken out of the atmosphere via a sink.
/b/ The United States primarily uses the 100-year GWP as a measure of the relative impact of different GHGs. However, the scientific community has developed a number of other metrics that could be used for comparing one GHG to another. These metrics may differ based on timeframe, the climate endpoint measured, or the method of calculation. For example, the 20-year GWP is sometimes used as an alternative to the 100-year GWP. Just like the 100-year GWP is based on the energy absorbed by a gas over 100 years, the 20-year GWP is based on the energy absorbed over 20 years. This 20-year GWP prioritizes gases with shorter lifetimes, because it does not consider impacts that happen more than 20 years after the emissions occur. Because all GWPs are calculated relative to CO_2, GWPs based on a shorter timeframe will be larger for gases with lifetimes shorter than that of CO_2, and smaller for gases with lifetimes longer than CO_2.

SOURCE: CARB, *Global Warming Potentials,* https://www.arb.ca.gov/cc/inventory/background/gwp.htm, accessed on December 8, 2020.

Existing Setting

Emissions of GHGs are the result of both natural and human-influenced activities. Volcanic activity, forest fires, decomposition, industrial processes, landfills, consumption of fossil fuels for power generation, transportation, heating, and cooling are the primary sources of GHG emissions. Without human activity, the Earth would maintain an approximate, but varied, balance between the emission of GHGs into the atmosphere and the storage of GHG in oceans and terrestrial ecosystems. Increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.) has contributed to a rapid increase in atmospheric levels of GHGs over the last 150 years.

Table 2 shows GHG emissions from 2010 to 2021 in California. California's GHG emissions have followed a declining trend since 2010. In 2019, emissions from routine emitting activities statewide were approximately 7 million metric tons of CO_2e ($MMTCO_2e$) lower than 2018 levels. Of note, between October 23, 2015 and February 18, 2016, an exceptional natural gas leak event occurred at the Aliso Canyon natural gas storage facility that resulted in unexpected GHG emissions of considerable magnitude. The exceptional incident released approximately 109,000 metric tons of CH_4, which equated to approximately 1.96 $MMTCO_2e$ of unanticipated emissions in 2015 and an additional 0.52 $MMTCO_2e$ in 2016. According to CARB, these emissions will be mitigated in the future through projects funded by the Southern California Gas Company based on legal settlement and are presented alongside but tracked separately from routine inventory emissions.[1,2]

TABLE 2: CALIFORNIA GREENHOUSE GAS EMISSIONS INVENTORY TREND										
	CO_2e Emissions (Million Metric Tons)									
Sector	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Electricity Generation (In-State)	46.7	42.6	53.7	51.4	52.1	50.9	42.2	38.2	38.5	37.2
Electricity Generation (Imports)	43.6	46.6	44.4	40.0	36.8	33.9	26.4	23.9	24.6	21.7
Transportation	165.1	161.8	161.4	161.3	162.6	166.2	169.8	171.2	169.6	166.1
Industrial	91.1	89.4	88.9	91.7	92.5	90.3	89.0	88.8	89.2	88.2
Commercial and Residential	45.9	46.0	43.5	44.2	38.2	38.8	40.6	41.3	41.4	43.8
Agriculture	33.7	34.4	35.5	33.8	34.7	33.5	33.3	32.5	32.7	31.8
High GWP	13.5	14.5	15.5	16.8	17.7	18.6	19.2	20.0	20.4	20.6
Recycling and Waste	8.3	8.4	8.3	8.4	8.4	8.5	8.6	8.7	8.7	8.9
Emissions Total	**447.9**	**443.7**	**451.3**	**447.6**	**443.0**	**440.7**	**429.1**	**424.6**	**425.1**	**418.2**
SOURCE: CARB, *California Greenhouse Gas Emission Inventory - 2021 Edition*, available at https://ww2.arb.ca.gov/ghg-inventory-data.										

At the local level, CSULB developed and published a Climate Action Plan (CAP) in 2014 that estimated emissions associated with students, faculty, and staff commuting in 2010. Although not adopted, it provides guidance for campus operations. **Table 3** shows that commuting accounted for the majority of GHG emissions in 2010, followed by purchased electricity and natural gas combustion.

[1]CARB, *California Greenhouse Gas Inventory for 2000-2019 – Trends of Emissions and Other Indicators*, July 2021.
[2]CARB, *Determination of Total Methane Emissions from the Aliso Canyon Natural Gas Leak Incident*, October 2016.

TABLE 3: CSULB CAMPUS-WIDE GREENHOUSE GAS EMISSIONS INVENTORY		
CSULB GHG Sources	**CO2e (Metric Tons)**	**Percentage of Total**
Student Commuting	31,580	53%
Purchased Electricity	13,340	22%
Natural Gas Combustion	6,050	10%
Faculty and Staff Commuting	4,460	7%
Landfill Waste	1,480	2%
Refrigerant Emissions	1,360	2%
Air Travel	1,270	2%
Fleet Fuels	390	1%
Total 2010 GHG Emissions	**59,930**	**100%**
SOURCE: CSULB, *Climate Action Plan*, December 2014.		

Regulatory Framework

There are many federal, state, regional, and local regulations and policies related to climate change and GHG emissions. The following list is not designed to be a comprehensive list of regulations and policies and is focused on select regulations and policies that are pertinent to CSULB and the proposed project.

Federal

***Massachusetts vs. Environmental Protection Agency*, 127 S. Ct. 1438 (2007)**. A Supreme Court ruling that CO_2 and other GHGs are pollutants under the Clean Air Act.

Energy Independence and Security Act. This act set a Renewable Fuel Standard of 36 billion gallons of biofuel usage by 2022, increases Corporate Average Fuel Economy Standards of setting 35 miles per gallon of cars and light trucks by 2020 and sets new standards for lighting and residential and commercial appliance equipment.

National Fuel Efficiency Policy and Fuel Economy Standards. This 2009 policy was designed to increase fuel economy by more than five percent by 2016 starting with model year 2012 cars and trucks.

Heavy-Duty Vehicle Program. This 2011 program established the first fuel efficiency requirements for medium- and heavy-duty vehicles beginning with model year 2014.

State

California Building Energy Efficiency Standards (Title 24, Part 6). The California Building Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) were adopted to ensure that building construction and system design and installation achieve energy efficiency and preserve outdoor and indoor environmental quality. The 2019 Title 24 Standards went into effect on January 1, 2020. The 2019 Title 24 Standards represent "challenging but achievable design and construction practices" that represent a major step towards meeting the Zero Net Energy (ZNE) goal." Homes built with the 2019 standards will use about 7 percent less energy due to energy efficiency measures versus those built under the 2016 standards. Once rooftop solar electricity generation is factored in, homes built under the 2019 standards will use about 53 percent less energy than those built under the 2016 standards. The California Building Code is updated triennially and is expected to become more energy efficient with each update.

California Green Building Standards (Title 24, Part 11). The California Green Building Standards Code (California Code of Regulations, Title 24, Part 11), commonly referred to as the CALGreen Code, includes mandatory measures related to energy efficiency, water efficiency and conservation, material conservation, resource efficiency, and environmental quality. Compliance with the CALGreen Code is enforced through the building permit process.

Senate Bill 1078 (SB 1078), Senate Bill 107 (SB 107), Executive Order (E.O.) S-14-08 (Renewables Portfolio Standard), and Senate Bill 100 (SB 100). Signed on September 12, 2002, SB 1078 required California to generate 20 percent of its electricity from renewable energy by 2017. SB 107, signed on September 26, 2006, changed the due date for this goal from 2017 to 2010, which was achieved by the State. On November 17, 2008, E.O. S-14-08 established a Renewables Portfolio Standard target for California requiring that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. SB 100 accelerated and expanded the standards set forth in SB 350 by establishing that 44 percent of the total electricity sold to retail customers in California per year by December 31, 2024, 52 percent by December 31, 2027, and 60 percent by December 31, 2030, be secured from qualifying renewable energy sources. SB 100 also states that it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100 percent of the retail sales of electricity to California. This bill requires that the achievement of 100 percent zero-carbon electricity resources does not increase the carbon emissions elsewhere in the western grid and that the achievement not be achieved through resource shuffling.

Executive Order (E.O.) S-3-05. E.O. S-3-05 set the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Assembly Bill 32. The California Global Warming Solutions Act of 2006, also known as Assembly Bill 32, focuses on reducing GHG emissions in California and requires the California Air Resources Board (CARB) to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020. The 2020 target reductions were estimated to be 174 million metric tons of CO_2e. In November 2017, CARB adopted California's 2017 Scoping Plan: The Strategy for Achieving California's 2030 GHG target (2017 Scoping Plan). The 2017 Scoping Plan incorporates, coordinates, and leverages many existing and ongoing efforts and identifies new policies and actions to accomplish the State's climate goals.

Senate Bill 375 (SB 375). Provides a means for achieving Assembly Bill 32 goals through the reduction in emissions by cars and light trucks. SB 375 requires Regional Transportation Plans (RTPs) prepared by Metropolitan Planning Organizations (MPOs) to include Sustainable Communities Strategies (SCSs).

Senate Bill 743 (SB 743). SB 743, adopted September 27, 2013, encourages land use and transportation planning decisions and investments that reduce vehicle miles traveled, which contribute to GHG emissions, as required by AB 32. Key provisions of SB 743 include reforming aesthetics and parking CEQA analysis for certain urban infill projects and eliminating the measurement of auto delay, including Level of Service, as a metric that can be used for measuring traffic impacts in transit priority areas. SB 743 requires the Governor's Office of Planning and Research to develop revisions to the CEQA Guidelines establishing criteria for determining the significance of transportation impacts of projects within transit priority areas that promote the "…reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." It also allows the Office of Planning and Research to develop alternative metrics outside of transit priority areas.

Executive Order (E.O) B-30-15. This policy set a goal to reduce GHG emissions 40 percent below their 1990 levels by 2030. The E.O. establishes GHG emissions reduction targets to reduce emissions to 80 percent below 1990 levels by 2050 and sets an interim target of emissions reductions for 2030 as being necessary to guide regulatory policy and investments in California and put California on the most cost-effective path for long-term emissions reductions.

Senate Bill 32 (SB 32). This bill requires that statewide GHG emissions be reduced to 40 percent less than 1990 levels by 2030.

Executive Order (E.O) B-55-18. This policy established a statewide policy to achieve carbo neutrality as soon as possible and no later than 2045 and to achieve and maintain net negative emissions thereafter. The E.O. states that the new goal is in addition to the prior statewide targets for reduction of GHG emissions.

Regional

Southern California Association of Governments (SCAG) 2020–2045 Regional Transportation Plan/ Sustainable Communities Strategy (RTP/SCS). The SCAG Regional Council formally adopted the Connect SoCal 2020–2045 RTP/SCS (Connect SoCal) on September 3, 2020. Rooted in the 2008 and 2012 RTP/SCS plans, Connect SoCal's "Core Vision" focuses on maintaining and enhancing management of the transportation network while also expanding mobility choices by creating hubs that connect housing, jobs, and transit accessibility. The "Core Vision" of Connect SoCal is organized into six key focus areas that expand upon progress made in the 2016 RTP/SCS: Sustainable Development, System Preservation and Resilience, Demand & System Management, Transit Backbone, Complete Streets, and Goods Movement. Connect SoCal incorporates a range of best practices for increasing transportation choices, reducing dependence on personal automobiles, further improving air quality and reducing GHG emissions, and encouraging growth in walkable, mixed-use communities with convenient access to transit infrastructure and employment.

Each of the six key focus areas in Connect SoCal contains strategies to achieve the intended holistic objectives of the Connect SoCal Growth Vision. The Sustainable Development focus area is the portion of the planning document dedicated to the SCS, which is the most directly applicable element to GHG emissions. The SCS evaluated the following Priority Growth Areas (PGAs) that were selected and developed based on their ability to support potential mode shift and shortened trip distances:

- Transit Priority Areas (TPAs) are defined as an area within one-half mile of a major transit stop that is existing or planned. This includes an existing rail or bus rapid transit station, a ferry terminal served by bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. (Based on California Public Resources Code Section 21099 (a)(7) and Section 21064.3)
- High Quality Transit Areas (HQTAs) are generally walkable transit villages or corridors, consistent with the adopted RTP/SCS that are within one half-mile of a well-serviced transit stop or a transit corridor with 15-minute or less service frequency during peak commute hours. Freeway transit corridors with no bus stops on the freeway alignment do not have a directly associated HQTA. A high-quality transit corridor (HQTC) is defined as a corridor with fixed route bus service containing intervals no longer than 15 minutes during peak commute hours (Based on California Public Resources Code Section 21155(b)).

- Livable Corridors refer to an arterial network that is a subset of the HQTAs based on level of transit service and land use planning efforts.
- Neighborhood Mobility Areas (NMAs) are areas with high intersection density (generally 50 intersections per square mile or more), low to moderate traffic speeds and robust residential retail connections which can support the use of Neighborhood Electric Vehicles or active transportation for short trips.
- Job Centers are areas with significantly higher employment density than surrounding areas.

Connect SoCal devised a growth priority hierarchy in order to optimize opportunities for shorter trip distances and drivers to switch to electric vehicles, which directs growth towards the areas described above in the following order: TPAs, Livable Corridors, Job Centers, HQTAs, and NMAs. Development in these areas will be guided by the following Connect SoCal strategies to reduce GHG emissions: focusing growth near destinations and mobility options; promoting diverse housing choice; leveraging technology innovations; supporting implementation of sustainability policies; and promoting a green region. SCAG, in conjunction with CARB, determined that implementation of Connect SoCal would achieve regional GHG reductions relative to 2005 SCAG areawide levels of approximately eight percent in 2020 and approximately 19 percent by 2035.[3] The regional GHG emissions reductions achieved through the Connect SoCal Growth Vision are consistent with the regional targets set forth by CARB through SB 375.

Local

In May 2014, the Cal State University (CSU) Board of Trustees adopted the first systemwide Sustainability Policy, which applies sustainable principles across all areas of university operations, including facility sustainability improvements, energy and water efficiency retrofits, and incorporation of green building practices into new facility design. The Sustainability Policy was updated March 23, 2022.[4] CSU policy requires all new construction and major renovations to be achieve the equivalent of a silver level of certification under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system. The LEED rating system assesses buildings in accordance with sustainability criteria across many areas, including location and transportation, energy and water efficiency, materials, indoor environmental quality, integration of the site with its natural environment, and innovation.

In addition to adhering to LEED green building standards, CSULB is committed to pursuing the principles of Net Zero Energy (NZE) to all new campus buildings. Buildings will be designed to not only minimize consumption of energy and other natural resources, but also to use only as much energy as they can generate from renewable energy sources such as solar photovoltaic systems. In December 2014, the CSULB CAP was released.[5] The CAP sets the path for CSULB to achieve the goal of carbon neutrality by the year 2030. The plan's emission reduction strategies are broken out into four categories (transportation, energy operation, and carbon offsets) that will advance CSULB goals towards carbon neutrality in 2030. However, the CSULB CAP did not undergo environmental review or formal adoption by the CSU and is not a qualified GHG reduction plan under CEQA Guidelines Section 15183.5. Thus, it cannot be used in a cumulative impacts analysis to determine impact significance.

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[3]SCAG, *Connect SoCal 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy*, May 2020.
[4]California State University Board of Trustees, *Sustainability Policy*, March 23, 2022.
[5]CSULB, *Climate Action Plan*, December 2014.

Additionally, in 2016, CSULB President Conoley signed the Climate Commitment to integrate carbon neutrality with climate resilience and established the President's Commission on Sustainability in 2018, with the mission of integrating sustainability--defined as the intentional and simultaneous focus on environmental, social, and economic health--into all aspects of the university.[6]

Significance Thresholds

This Assessment was undertaken to determine whether construction or operation of the proposed project would have the potential to result in significant environmental impacts related to GHG emissions in the context of the Appendix G Environmental Checklist criteria of the CEQA Statute and Guidelines. Implementation of the proposed project may result in a significant environmental impact related to GHG emissions if the proposed project would:

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

Section 15064.4 of the CEQA Guidelines states that a lead agency should make a good-faith effort to describe, calculate, or estimate the amount of GHG emissions resulting from a project, and that the lead agency should consider the following factors when assessing the significance of impacts from GHG emissions on the environment:

1. The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and,
3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

The CEQA Guidelines require lead agencies to adopt GHG thresholds of significance. When adopting these thresholds, the amended Guideline allows lead agencies to consider thresholds of significance adopted or recommended by other public agencies, or recommended by experts, provided that the thresholds are supported by substantial evidence, and/or to develop their own significance threshold. Neither the City nor the SCAQMD has officially adopted a quantitative threshold value for determining the significance of GHG emissions that will be generated by projects under CEQA. The SCAQMD published the *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold* in October 2008.[7]

The SCAQMD convened a GHG CEQA Significance Threshold Stakeholder Working Group beginning in April of 2008 to examine alternatives for establishing quantitative GHG thresholds. The Working Group proposed a 10,000 metric tons of carbon dioxide equivalents ($MTCO_2e$) per year threshold for industrial projects and a 1,400 $MTCO_2e$ annual threshold for commercial projects. Based on the available threshold concepts recommended by expert agencies, the assessment herein analyses operational emissions against SCAQMD's draft

[6]CSULB, *Climate Leadership Statement prepared by Second Nature*, 2016.
[7]SCAQMD, *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold*, October 2008.

1,400 $MTCO_2e$ bright-line threshold level. Per SCAQMD, projects below this bright-line significance criteria have a minimal contribution to cumulative global emissions and are considered to have less-than significant impacts.

Methodology

GHG emissions were estimated using the California Emissions Estimator Model (CalEEMod), as recommended by the SCAQMD. CalEEMod quantifies GHG emissions from construction activities and future operation of projects. Sources of GHG emissions during project construction would include heavy-duty off-road diesel equipment and vehicular travel to and from the project site. The construction emissions analysis was based on a combination of detailed information provided by the CSULB project team and CalEEMod default assumptions related to typical construction activities. In accordance with SCAQMD methodology, the total amount of GHG emissions that would be generated by construction of the proposed project was amortized over the operational life of the project to represent long-term impacts, which for this project is assumed to be 30 years.

Sources of GHG emissions during project operation include automobile trips associated with the clinic, landscaping equipment, water use, and waste generation. A transportation analysis completed for the proposed project estimated that the clinic would generate 564 daily trips. Mobile source emissions were estimated using EMFAC emission rates in CalEEMod. Emissions related to solid waste were calculated using the CalEEMod emissions inventory model, which multiplies an estimate of the waste generated by applicable emissions factors, provided in Section 2.4 of USEPA's AP-42, Compilation of Air Pollutant Emission Factors. CalEEMod solid waste generation rates for each applicable land use were selected for this analysis. Emissions related to water usage and wastewater generation were calculated using CalEEMod emission inventory model which multiplies an estimate of the water usage by the applicable energy intensity factor to determine the embodied energy necessary to supply potable water. GHG emissions are related to the energy used to convey, treat, and distribute water and wastewater. Thus, the emissions are generally indirect emissions from the production of electricity to power these systems. GHG emissions are then calculated based on the amount of electricity consumed multiplied by the GHG intensity factors for the utility provider. In this case, embodied energy for southern California supplied water and GHG intensity factors for Southern California Edison were selected in CalEEMod.

Impact Assessment

a) Would the proposed project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment? (Less-than-Significant Impact)

Implementation of the proposed project would generate both direct and indirect GHG emissions; however, the magnitude of emissions would be minimized through the incorporation of robust project design and sustainability features that enhance energy efficiency and reduce resource consumption. Temporary direct GHG emissions would be generated from the use of off-road equipment and truck/worker vehicle trips during construction activities. Mandatory compliance with SCAQMD regulations that restrict vehicle idling and ensure optimal equipment operating conditions would prevent the occurrence of excessive GHG emissions from these sources. The SCAQMD recommends that temporary GHG emissions associated with construction of CEQA projects be amortized over the operational life of the project to reflect the cumulative nature of climate change implications, which for this project is assumed to be 30 years. The amortized construction emissions are estimated at 63.0 metric tons of CO_2e per year, which is well below the threshold of 1,400 metric tons of CO_2e per year, as shown in **Table 4**. Construction of the proposed project would generate a cumulative total of 1,889 $MTCO_2$e over the two-year construction period.

Table 4 also discloses that, after construction activities are complete, operation of the proposed project would generate approximately 962.5 $MTCO_2$e of GHG emissions annually, with the majority attributed to mobile- and energy-related sources. Indirect GHG emissions from electricity consumption would gradually decline in subsequent years as Southern California Edison (SCE) derives more of its power mix from renewable sources that do not produce GHG emissions to provide electricity. Furthermore, the new building would be more energy-efficient than the structures it is replacing. GHG emissions would not exceed the SCAQMD draft interim significance threshold of 1,400 $MTCO_2$e of GHG emissions annually. Therefore, the proposed project would result in a less-than-significant impact related to GHG emissions.

TABLE 4: PROPOSED PROJECT ANNUAL GREENHOUSE GAS EMISSIONS

CSULB GHG Sources	CO_2e (Metric Tons)
Construction Emissions Amortized (Direct)	63.0
Area Source Emissions (Direct)	<0.1
Energy Source Emissions (Indirect)	398.6
Mobile Source Emissions (Direct)	475.3
Waste Disposal Emissions (Indirect)	63.5
Water Distribution Emissions (Indirect)	25.1
TOTAL	**962.5**
SCAQMD Draft Interim Significance Threshold	1,400
Exceed Threshold?	**No**

SOURCE: TAHA, 2021.

Mitigation Measure

No mitigation measures are required.

b) Would the proposed project conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs? (No Impact)

There are a number of plans GHG reduction plans, policies, and regulations relevant to the proposed project. **Tables 5** and **6** demonstrate consistency with the SCAG RTP/SCS and the State Scoping Plan GHG Reduction Strategies. The proposed project would not impede the attainment of the GHG reduction goals for 2030 or 2050 identified in E.O0 S-03-05 and SB 32, or the carbon neutrality goal for 2045 identified in E.O. B-55-18. E.O. S-03-05 establishes the following goals: GHG emissions should be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. SB 32 establishes for a statewide GHG emissions reduction target whereby CARB, in adopting rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions, shall ensure that statewide GHG emissions are reduced to at least 40 percent below 1990 levels by December 31, 2030. E.O. B-55-18 establishes an additional statewide policy goal to achieve carbon neutrality as soon as possible and no later than 2045 and to achieve and maintain net negative emissions thereafter. Importantly, the CSULB CAP and related

Sustainability Policy apply sustainable principles across all areas of university operations, including facility sustainability improvements, energy and water efficiency retrofits, and incorporation of green building practices into new facility design. The proposed project would incorporate energy-efficiency, sustainability, water- and waste-efficiency, and resiliency features to achieve a Net Zero Energy Rating and a LEED Gold, or better, building Rating. The building envelope would be configured to maximize daylighting and exterior views. Existing building-serving utilities, including storm drain, electrical, heating, cooling, water, and wastewater, would be removed and replaced to appropriately serve the new building. Therefore, the proposed project would result in a less than significant impact related to conflict with GHG reduction plans.

Mitigation Measures

No mitigation measures are required.

TABLE 5: PROJECT CONSISTENCY WITH SCAG 2020 RTP/SCS

RTP/SCS Measure	Project/Consistency
Encourage regional economic prosperity and global competitiveness	**Not Applicable**. The proposed project would not inhibit SCAG from preserving the encouraging regional economic prosperity.
Improve mobility, accessibility, reliability, and travel safety for people and goods	**Not Applicable**. The proposed project would not inhibit SCAG from improving mobility
Enhance the preservation, security, and resilience of the regional transportation system	**Not Applicable**. The proposed project would not inhibit SCAG from preserving and expanding the regional transportation system.
Increase person and goods movement and travel choices within the transportation system	**Not Applicable**. The proposed project would not inhibit SCAG from expand travel choices within the transportation system.
Reduce greenhouse gas emissions and improve air quality	**Consistent**. The proposed project would incorporate energy-efficient, sustainable, water and waste efficient, and resilient features to achieve a Net Zero Energy Rating and beyond a LEED Gold Rating. This would reduce energy requirements and associated air quality pollution and GHG emissions.
Support healthy and equitable communities	**Consistent**. The proposed project would include a clinic space and increase training opportunities for health profession students.
Adapt to a changing climate and support an integrated regional development pattern and transportation network	**Consistent** The proposed project location is located within walking and biking distance of the campus.
Leverage new transportation technologies and data-driven solutions that result in more efficient travel	**Not Applicable**. The proposed project would not inhibit SCAG from leveraging technology for the transportation system.
Encourage development of diverse housing types in areas that are supported by multiple transportation options	**Not Applicable**. The proposed project would not inhibit SCAG from developing diverse housing.
Promote conservation of natural and agricultural lands and restoration of habitats	**Consistent**. The proposed project would not impact natural lands during construction or operation.
SOURCE: TAHA, 2021.	

TABLE 6: PROJECT CONSISTENCY WITH SCOPING PLAN GHG REDUCTION STRATEGIES		
Reduction Strategy	**Measure Number**	**Project/Consistency**
Goals		
Advanced Clean Cars	T-1	**Consistent**. Visitors to the replacement building would purchase vehicles in compliance with CARB vehicle standards that are in effect at the time of vehicle purchase.
Low-Carbon Fuel Standard	T-2	**Consistent**. Motor vehicles driven by visitors to the replacement building would use compliant fuels.
Regional Transportation-Related GHG Targets	T-3	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Advanced Clean Transit	Proposed	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Last-Mile Delivery	Proposed	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Reduction in VMT	Proposed	**Consistent**. The proposed project would not change demand on the transportation system as the proposed project would be built to accommodate existing occupancy.
Vehicle Efficiency Measures 1. Tire Pressure 2. Fuel Efficiency Tire Program 3. Low-Friction Oil 4. Solar-Reflective Automotive Paint and Window Glazing	T-4	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Ship Electrification at Ports (Shore Power)	T-5	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Goods Movement Efficiency Measures 1. Port Drayage Trucks 2. Transport Refrigeration Units Cold Storage Prohibition 3. Cargo Handling Equipment, Anti-Idling, Hybrid, Electrification 4. Goods Movement System-wide Efficiency Improvements 5. Commercial Harbor Craft Maintenance and Design Efficiency 6. Clean Ships 7. Vessel Speed Reduction	T-6	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Heavy-Duty Vehicle GHG Emission Reduction • Tractor-Trailer GHG Regulation Heavy-Duty Greenhouse Gas Standards for New Vehicle and Engines (Phase I)	T-7	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Medium- and Heavy-Duty Vehicle Hybridization Voucher Incentive Proposed Project	T-8	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.

TABLE 6: PROJECT CONSISTENCY WITH SCOPING PLAN GHG REDUCTION STRATEGIES		
Medium and Heavy-Duty GHG Phase 2	Proposed	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
High-Speed Rail	T-9	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
ELECTRICITY AND NATURAL GAS SECTOR		
Energy Efficiency Measures (Electricity)	E-1	**Consistent**. The proposed project would be constructed to meet Net Zero Energy Rating and beyond a LEED Gold Rating.
Energy Efficiency (Natural Gas)	CR-1	**Consistent**. The proposed project would result in minimal new natural gas use. The proposed project would be constructed to meet Net Zero Energy Rating and beyond a LEED Gold Rating.
Solar Water Heating (California Solar Initiative Thermal Program)	CR-2	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Combined Heat and Power	E-2	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Renewable Portfolios Standard (33% by 2020)	E-3	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Renewable Portfolios Standard (50% by 2050)	Proposed	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
SB 1 Million Solar Roofs (California Solar Initiative, New Solar Home Partnership, Public Utility Programs) and Earlier Solar Programs	E-4	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
WATER SECTOR		
Water Use Efficiency	W-1	**Consistent**. The proposed project would be constructed to meet Net Zero Energy Rating and beyond a LEED Gold Rating, including water efficiency.
Water Recycling	W-2	**Consistent**. The proposed project would utilize recycled water where possible
Water-System Energy Efficiency	W-3	**Consistent**. CSULB aims to reduce its water consumption by 20% below the 2013 baseline. The project will meet the 20% goal by implementing ultra-low flow/low-flush fixtures, such as waterless urinals.
Reuse Urban Runoff	W-4	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Renewable Energy Production	W-5	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
GREEN BUILDINGS		
State Green Building Initiative: Leading the Way with State Buildings (Greening New and Existing State Buildings)	GB-1	**Consistent**. The proposed project would exceed energy efficiency requirements in Title 24, Part 6, of the California Code of Regulations in accordance the CSULB sustainability plans.
Green Building Standards Code (Greening New Public Schools, Residential and Commercial Buildings)	GB-1	**Consistent**. The proposed project would exceed energy efficiency requirements in Title 24, Part 6, of the California Code of Regulations in accordance the CSULB sustainability plans.

TABLE 6: PROJECT CONSISTENCY WITH SCOPING PLAN GHG REDUCTION STRATEGIES		
Beyond Code: Voluntary Programs at the Local Level (Greening New Public Schools, Residential and Commercial Buildings)	GB-1	**Consistent**. The proposed project would exceed energy efficiency requirements in Title 24, Part 6, of the California Code of Regulations in accordance the CSULB sustainability plans.
Greening Existing Buildings (Greening Existing Homes and Commercial Buildings)	GB-1	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
INDUSTRY SECTOR		
Energy Efficiency and Co-Benefits Audits for Large Industrial Sources	I-1	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Oil and Gas Extraction GHG Emission Reduction	I-2	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Reduce GHG Emissions by 20% in Oil Refinery Sector	Proposed	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
GHG Emissions Reduction from Natural Gas Transmission and Distribution	I-3	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Refinery Flare Recovery Process Improvements	I-4	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Work with the local air districts to evaluate amendments to their existing leak detection and repair rules for industrial facilities to include methane leaks	I-5	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
RECYCLING AND WASTE MANAGEMENT SECTOR		
Landfill Methane Control Measure	RW-1	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Increasing the Efficiency of Landfill Methane Capture	RW-2	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Mandatory Commercial Recycling	RW-3	**Consistent**. The proposed project would comply with all state regulations related to solid waste generation, storage, and disposal, including the California Integrated Waste Management Act, as amended.
Increase Production and Markets for Compost and Other Organics	RW-3	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Anaerobic/Aerobic Digestion	RW-3	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Extended Producer Responsibility	RW-3	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Environmentally Preferable Purchasing	RW-3	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.

TABLE 6: PROJECT CONSISTENCY WITH SCOPING PLAN GHG REDUCTION STRATEGIES		
FORESTS SECTOR		
Sustainable Forest Target	F-1	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
HIGH-GWP GASES SECTOR		
Motor Vehicle Air Conditioning Systems: Reduction of Refrigerant Emissions from Non-Professional Servicing	H-1	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
SF6 Limits in Non-Utility and Non-Semiconductor Applications	H-2	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Reduction of Perfluorocarbons (PFCs in Semiconductor Manufacturing	H-3	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Limit High GWP Use in Consumer Products	H-4	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Air Conditioning Refrigerant Leak Test During Vehicle Smog Check	H-5	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Stationary Equipment Refrigerant Management Program – Refrigerant Tracking/Reporting/Repair Program	H-6	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
Stationary Equipment Refrigerant Management Program – Specifications for Commercial and Industrial Refrigeration	H-6	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
SF6 Leak Reduction Gas Insulated Switchgear	H-6	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
40% reduction in methane and hydrofluorocarbon (HFC) emissions	Proposed	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
50% reduction in black carbon emissions	Proposed	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
AGRICULTURE SECTOR		
Methane Capture at Large Diaries	A-1	**Not Applicable**. The proposed project would not prevent CARB from implementing this measure.
SOURCE: TAHA, 2021.		

References

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California Air Resources Board, *California Greenhouse Gas Inventory for 2000-2019 – Trends of Emissions and Other Indicators*, July 2021.

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California Environmental Protection Agency Climate Action Team, *Climate Action Report to Governor Schwarzenegger and the California Legislator*, March 2006.

California Environmental Quality Act Guidelines Section 15064.4.

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South Coast Air Quality Management District, *SCAQMD Air Quality Significance Thresholds*, March 2015.

Southern California Association of Governments, *Connect SoCal 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy*, May 2020.

CSULB Peterson Hall 1 Replacement 2020-100

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Library	137.07	1000sqft	3.15	137,072.00	0
Parking Lot	45.00	Space	0.41	18,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2025
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Construction of new 137,072 gross square feet, three-story building with 45 space parking lot

Construction Phase - Demolition: 2 months, Site Prep: 2 months, Grading: 2 months, Trenching: 2 months, Building Construction: 13 months, Paving 1.5 months, Architectural coating: 2 months

Off-road Equipment - Conservative estimate

Off-road Equipment - From construction data list

Off-road Equipment - From construction data list

Off-road Equipment - Construction data list

Off-road Equipment - From construction data list

Off-road Equipment - From construction data list

Off-road Equipment - From construction data list

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Trips and VMT - From construction data list/PD. Conservative estimates. Haul trips during demo and grading represent the maximum daily trips during phases.

Demolition -

Grading -

Architectural Coating - SCAQMD Rule 1113 = 50g/L for building envelope coatings

Vehicle Trips - Project would generate an estimated 564 daily trips

Area Coating - SCAQMD Rule 1113

Construction Off-road Equipment Mitigation - SCAQMD Rule 403

Mobile Land Use Mitigation -

Area Mitigation - SCAQMD Rule 1113

Energy Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	100.00	50.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	100	50
tblConstructionPhase	NumDays	18.00	45.00
tblConstructionPhase	NumDays	230.00	280.00
tblConstructionPhase	NumDays	20.00	45.00
tblConstructionPhase	NumDays	8.00	45.00
tblConstructionPhase	NumDays	18.00	35.00
tblConstructionPhase	NumDays	5.00	45.00
tblGrading	MaterialExported	0.00	4,000.00
tblLandUse	LandUseSquareFeet	137,070.00	137,072.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	7.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblOffRoadEquipment	UsageHours	7.00	6.00
tblOffRoadEquipment	UsageHours	8.00	7.00
tblTripsAndVMT	HaulingTripNumber	105.00	3,240.00
tblTripsAndVMT	HaulingTripNumber	500.00	800.00
tblTripsAndVMT	VendorTripNumber	25.00	104.00
tblTripsAndVMT	VendorTripNumber	0.00	30.00
tblTripsAndVMT	VendorTripNumber	0.00	8.00
tblTripsAndVMT	WorkerTripNumber	13.00	100.00
tblTripsAndVMT	WorkerTripNumber	8.00	100.00
tblTripsAndVMT	WorkerTripNumber	8.00	100.00
tblTripsAndVMT	WorkerTripNumber	13.00	100.00
tblTripsAndVMT	WorkerTripNumber	65.00	770.00
tblTripsAndVMT	WorkerTripNumber	13.00	100.00
tblTripsAndVMT	WorkerTripNumber	13.00	100.00
tblVehicleTrips	ST_TR	80.09	4.12

tblVehicleTrips	SU_TR	42.09	4.12
tblVehicleTrips	WD_TR	72.05	4.12

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0727	0.8041	0.6376	2.2400e-003	0.2135	0.0270	0.2405	0.0821	0.0251	0.1072	0.0000	209.6978	209.6978	0.0280	0.0160	215.1568
2024	0.3826	1.9724	3.8168	0.0108	0.9735	0.0687	1.0422	0.2861	0.0650	0.3511	0.0000	994.9507	994.9507	0.0682	0.0406	1,008.7630
2025	0.7915	1.1111	2.4801	7.1000e-003	0.5620	0.0333	0.5954	0.1502	0.0319	0.1821	0.0000	656.3481	656.3481	0.0386	0.0260	665.0735
Maximum	**0.7915**	**1.9724**	**3.8168**	**0.0108**	**0.9735**	**0.0687**	**1.0422**	**0.2861**	**0.0650**	**0.3511**	**0.0000**	**994.9507**	**994.9507**	**0.0682**	**0.0406**	**1,008.7630**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0727	0.8041	0.6376	2.2400e-003	0.1287	0.0270	0.1557	0.0442	0.0251	0.0693	0.0000	209.6978	209.6978	0.0280	0.0160	215.1567
2024	0.3826	1.9724	3.8168	0.0108	0.8788	0.0687	0.9475	0.2450	0.0650	0.3099	0.0000	994.9505	994.9505	0.0682	0.0406	1,008.7627
2025	0.7915	1.1111	2.4801	7.1000e-003	0.5620	0.0333	0.5954	0.1502	0.0319	0.1821	0.0000	656.3479	656.3479	0.0386	0.0260	665.0733
Maximum	**0.7915**	**1.9724**	**3.8168**	**0.0108**	**0.8788**	**0.0687**	**0.9475**	**0.2450**	**0.0650**	**0.3099**	**0.0000**	**994.9505**	**994.9505**	**0.0682**	**0.0406**	**1,008.7627**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	10.27	0.00	9.56	15.24	0.00	12.34	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	9-4-2023	12-3-2023	0.7109	0.7109
2	12-4-2023	3-3-2024	0.4386	0.4386
3	3-4-2024	6-3-2024	0.4524	0.4524
4	6-4-2024	9-3-2024	0.6714	0.6714
5	9-4-2024	12-3-2024	0.6760	0.6760
6	12-4-2024	3-3-2025	0.6494	0.6494
7	3-4-2025	6-3-2025	0.6411	0.6411
8	6-4-2025	9-3-2025	0.5421	0.5421
9	9-4-2025	9-30-2025	0.2387	0.2387
		Highest	0.7109	0.7109

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.5525	2.0000e-005	2.3200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.5200e-003	4.5200e-003	1.0000e-005	0.0000	4.8100e-003
Energy	0.0133	0.1207	0.1014	7.2000e-004		9.1700e-003	9.1700e-003		9.1700e-003	9.1700e-003	0.0000	396.4859	396.4859	0.0249	5.1200e-003	398.6343
Mobile	0.2476	0.2584	2.3595	4.9400e-003	0.5357	3.6900e-003	0.5394	0.1429	3.4300e-003	0.1464	0.0000	468.2308	468.2308	0.0338	0.0209	475.3120
Waste						0.0000	0.0000		0.0000	0.0000	25.6236	0.0000	25.6236	1.5143	0.0000	63.4813
Water						0.0000	0.0000		0.0000	0.0000	1.3606	23.1207	24.4813	0.1417	3.5400e-003	29.0777
Total	**0.8134**	**0.3791**	**2.4632**	**5.6600e-003**	**0.5357**	**0.0129**	**0.5486**	**0.1429**	**0.0126**	**0.1555**	**26.9842**	**887.8420**	**914.8261**	**1.7147**	**0.0296**	**966.5100**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.5525	2.0000e-005	2.3200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.5200e-003	4.5200e-003	1.0000e-005	0.0000	4.8100e-003
Energy	0.0133	0.1207	0.1014	7.2000e-004		9.1700e-003	9.1700e-003		9.1700e-003	9.1700e-003	0.0000	396.4859	396.4859	0.0249	5.1200e-003	398.6343
Mobile	0.2476	0.2584	2.3595	4.9400e-003	0.5357	3.6900e-003	0.5394	0.1429	3.4300e-003	0.1464	0.0000	468.2308	468.2308	0.0338	0.0209	475.3120
Waste						0.0000	0.0000		0.0000	0.0000	25.6236	0.0000	25.6236	1.5143	0.0000	63.4813
Water						0.0000	0.0000		0.0000	0.0000	1.0885	20.3337	21.4222	0.1135	2.8500e-003	25.1088
Total	**0.8134**	**0.3791**	**2.4632**	**5.6600e-003**	**0.5357**	**0.0129**	**0.5486**	**0.1429**	**0.0126**	**0.1555**	**26.7121**	**885.0550**	**911.7670**	**1.6865**	**0.0289**	**962.5411**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.31	0.33	1.64	2.33	0.41

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/4/2023	11/3/2023	5	45	
2	Site Preparation	Site Preparation	11/6/2023	1/5/2024	5	45	
3	Grading	Grading	1/8/2024	3/8/2024	5	45	

4	Trenching	Trenching	3/11/2024	5/10/2024	5	45	
5	Building Construction	Building Construction	5/13/2024	6/6/2025	5	280	
6	Paving	Paving	6/9/2025	7/25/2025	5	35	
7	Architectural Coating	Architectural Coating	7/28/2025	9/26/2025	5	45	

Acres of Grading (Site Preparation Phase): 42.19

Acres of Grading (Grading Phase): 33.75

Acres of Paving: 0.41

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 205,608; Non-Residential Outdoor: 68,536; Striped Parking Area: 1,080 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching	Trenchers	2	8.00	78	0.50
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37

Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Aerial Lifts	2	6.00	63	0.31
Architectural Coating	Air Compressors	2	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	100.00	0.00	3,240.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	100.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	100.00	0.00	800.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	5	100.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	770.00	104.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	100.00	30.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	4	100.00	8.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0113	0.0000	0.0113	1.7200e-003	0.0000	1.7200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0331	0.3222	0.3028	5.4000e-004		0.0152	0.0152		0.0142	0.0142	0.0000	47.4448	47.4448	0.0120	0.0000	47.7455
Total	**0.0331**	**0.3222**	**0.3028**	**5.4000e-004**	**0.0113**	**0.0152**	**0.0266**	**1.7200e-003**	**0.0142**	**0.0160**	**0.0000**	**47.4448**	**47.4448**	**0.0120**	**0.0000**	**47.7455**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.4200e-003	0.2228	0.0567	9.5000e-004	0.0279	1.3300e-003	0.0292	7.6600e-003	1.2800e-003	8.9300e-003	0.0000	94.4896	94.4896	5.2000e-003	0.0150	99.0913
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.1400e-003	5.6700e-003	0.0769	2.1000e-004	0.0247	1.5000e-004	0.0248	6.5500e-003	1.4000e-004	6.6900e-003	0.0000	19.8715	19.8715	5.2000e-004	5.1000e-004	20.0368
Total	**0.0106**	**0.2284**	**0.1336**	**1.1600e-003**	**0.0525**	**1.4800e-003**	**0.0540**	**0.0142**	**1.4200e-003**	**0.0156**	**0.0000**	**114.3611**	**114.3611**	**5.7200e-003**	**0.0155**	**119.1280**

3.2 Demolition - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.4200e-003	0.0000	4.4200e-003	6.7000e-004	0.0000	6.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0331	0.3222	0.3028	5.4000e-004		0.0152	0.0152		0.0142	0.0142	0.0000	47.4447	47.4447	0.0120	0.0000	47.7454
Total	**0.0331**	**0.3222**	**0.3028**	**5.4000e-004**	**4.4200e-003**	**0.0152**	**0.0196**	**6.7000e-004**	**0.0142**	**0.0149**	**0.0000**	**47.4447**	**47.4447**	**0.0120**	**0.0000**	**47.7454**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.4200e-003	0.2228	0.0567	9.5000e-004	0.0279	1.3300e-003	0.0292	7.6600e-003	1.2800e-003	8.9300e-003	0.0000	94.4896	94.4896	5.2000e-003	0.0150	99.0913
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.1400e-003	5.6700e-003	0.0769	2.1000e-004	0.0247	1.5000e-004	0.0248	6.5500e-003	1.4000e-004	6.6900e-003	0.0000	19.8715	19.8715	5.2000e-004	5.1000e-004	20.0368
Total	**0.0106**	**0.2284**	**0.1336**	**1.1600e-003**	**0.0525**	**1.4800e-003**	**0.0540**	**0.0142**	**1.4200e-003**	**0.0156**	**0.0000**	**114.3611**	**114.3611**	**5.7200e-003**	**0.0155**	**119.1280**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1278	0.0000	0.1278	0.0603	0.0000	0.0603	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0227	0.2485	0.1328	3.4000e-004		0.0102	0.0102		9.3400e-003	9.3400e-003	0.0000	30.2284	30.2284	9.7800e-003	0.0000	30.4729
Total	**0.0227**	**0.2485**	**0.1328**	**3.4000e-004**	**0.1278**	**0.0102**	**0.1379**	**0.0603**	**9.3400e-003**	**0.0697**	**0.0000**	**30.2284**	**30.2284**	**9.7800e-003**	**0.0000**	**30.4729**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.3500e-003	5.0400e-003	0.0683	1.9000e-004	0.0219	1.3000e-004	0.0221	5.8200e-003	1.2000e-004	5.9500e-003	0.0000	17.6635	17.6635	4.6000e-004	4.5000e-004	17.8105
Total	**6.3500e-003**	**5.0400e-003**	**0.0683**	**1.9000e-004**	**0.0219**	**1.3000e-004**	**0.0221**	**5.8200e-003**	**1.2000e-004**	**5.9500e-003**	**0.0000**	**17.6635**	**17.6635**	**4.6000e-004**	**4.5000e-004**	**17.8105**

3.3 Site Preparation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0498	0.0000	0.0498	0.0235	0.0000	0.0235	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0227	0.2485	0.1328	3.4000e-004		0.0102	0.0102		9.3400e-003	9.3400e-003	0.0000	30.2284	30.2284	9.7800e-003	0.0000	30.4728
Total	**0.0227**	**0.2485**	**0.1328**	**3.4000e-004**	**0.0498**	**0.0102**	**0.0600**	**0.0235**	**9.3400e-003**	**0.0329**	**0.0000**	**30.2284**	**30.2284**	**9.7800e-003**	**0.0000**	**30.4728**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.3500e-003	5.0400e-003	0.0683	1.9000e-004	0.0219	1.3000e-004	0.0221	5.8200e-003	1.2000e-004	5.9500e-003	0.0000	17.6635	17.6635	4.6000e-004	4.5000e-004	17.8105
Total	**6.3500e-003**	**5.0400e-003**	**0.0683**	**1.9000e-004**	**0.0219**	**1.3000e-004**	**0.0221**	**5.8200e-003**	**1.2000e-004**	**5.9500e-003**	**0.0000**	**17.6635**	**17.6635**	**4.6000e-004**	**4.5000e-004**	**17.8105**

3.3 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0355	0.0000	0.0355	9.6600e-003	0.0000	9.6600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7700e-003	0.0296	0.0166	4.0000e-005		1.2100e-003	1.2100e-003		1.1100e-003	1.1100e-003	0.0000	3.7782	3.7782	1.2200e-003	0.0000	3.8087
Total	**2.7700e-003**	**0.0296**	**0.0166**	**4.0000e-005**	**0.0355**	**1.2100e-003**	**0.0368**	**9.6600e-003**	**1.1100e-003**	**0.0108**	**0.0000**	**3.7782**	**3.7782**	**1.2200e-003**	**0.0000**	**3.8087**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.4000e-004	5.6000e-004	7.9600e-003	2.0000e-005	2.7400e-003	2.0000e-005	2.7600e-003	7.3000e-004	1.0000e-005	7.4000e-004	0.0000	2.1626	2.1626	5.0000e-005	5.0000e-005	2.1796
Total	**7.4000e-004**	**5.6000e-004**	**7.9600e-003**	**2.0000e-005**	**2.7400e-003**	**2.0000e-005**	**2.7600e-003**	**7.3000e-004**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**2.1626**	**2.1626**	**5.0000e-005**	**5.0000e-005**	**2.1796**

3.3 Site Preparation - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0139	0.0000	0.0139	3.7700e-003	0.0000	3.7700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7700e-003	0.0296	0.0166	4.0000e-005		1.2100e-003	1.2100e-003		1.1100e-003	1.1100e-003	0.0000	3.7782	3.7782	1.2200e-003	0.0000	3.8087
Total	**2.7700e-003**	**0.0296**	**0.0166**	**4.0000e-005**	**0.0139**	**1.2100e-003**	**0.0151**	**3.7700e-003**	**1.1100e-003**	**4.8800e-003**	**0.0000**	**3.7782**	**3.7782**	**1.2200e-003**	**0.0000**	**3.8087**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.4000e-004	5.6000e-004	7.9600e-003	2.0000e-005	2.7400e-003	2.0000e-005	2.7600e-003	7.3000e-004	1.0000e-005	7.4000e-004	0.0000	2.1626	2.1626	5.0000e-005	5.0000e-005	2.1796
Total	**7.4000e-004**	**5.6000e-004**	**7.9600e-003**	**2.0000e-005**	**2.7400e-003**	**2.0000e-005**	**2.7600e-003**	**7.3000e-004**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**2.1626**	**2.1626**	**5.0000e-005**	**5.0000e-005**	**2.1796**

3.4 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1197	0.0000	0.1197	0.0578	0.0000	0.0578	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0206	0.2189	0.1248	3.2000e-004		9.0000e-003	9.0000e-003		8.2800e-003	8.2800e-003	0.0000	27.8550	27.8550	9.0100e-003	0.0000	28.0802
Total	**0.0206**	**0.2189**	**0.1248**	**3.2000e-004**	**0.1197**	**9.0000e-003**	**0.1287**	**0.0578**	**8.2800e-003**	**0.0661**	**0.0000**	**27.8550**	**27.8550**	**9.0100e-003**	**0.0000**	**28.0802**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.4000e-004	0.0552	0.0143	2.3000e-004	6.8800e-003	3.3000e-004	7.2100e-003	1.8900e-003	3.2000e-004	2.2100e-003	0.0000	23.0005	23.0005	1.3000e-003	3.6500e-003	24.1218
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.6700e-003	5.0600e-003	0.0716	2.1000e-004	0.0247	1.5000e-004	0.0248	6.5500e-003	1.3000e-004	6.6800e-003	0.0000	19.4632	19.4632	4.7000e-004	4.7000e-004	19.6165
Total	**7.5100e-003**	**0.0602**	**0.0859**	**4.4000e-004**	**0.0315**	**4.8000e-004**	**0.0320**	**8.4400e-003**	**4.5000e-004**	**8.8900e-003**	**0.0000**	**42.4637**	**42.4637**	**1.7700e-003**	**4.1200e-003**	**43.7383**

3.4 Grading - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0467	0.0000	0.0467	0.0226	0.0000	0.0226	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0206	0.2189	0.1248	3.2000e-004		9.0000e-003	9.0000e-003		8.2800e-003	8.2800e-003	0.0000	27.8550	27.8550	9.0100e-003	0.0000	28.0802
Total	**0.0206**	**0.2189**	**0.1248**	**3.2000e-004**	**0.0467**	**9.0000e-003**	**0.0557**	**0.0226**	**8.2800e-003**	**0.0308**	**0.0000**	**27.8550**	**27.8550**	**9.0100e-003**	**0.0000**	**28.0802**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.4000e-004	0.0552	0.0143	2.3000e-004	6.8800e-003	3.3000e-004	7.2100e-003	1.8900e-003	3.2000e-004	2.2100e-003	0.0000	23.0005	23.0005	1.3000e-003	3.6500e-003	24.1218
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.6700e-003	5.0600e-003	0.0716	2.1000e-004	0.0247	1.5000e-004	0.0248	6.5500e-003	1.3000e-004	6.6800e-003	0.0000	19.4632	19.4632	4.7000e-004	4.7000e-004	19.6165
Total	**7.5100e-003**	**0.0602**	**0.0859**	**4.4000e-004**	**0.0315**	**4.8000e-004**	**0.0320**	**8.4400e-003**	**4.5000e-004**	**8.8900e-003**	**0.0000**	**42.4637**	**42.4637**	**1.7700e-003**	**4.1200e-003**	**43.7383**

3.5 Trenching - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0258	0.2389	0.2907	4.1000e-004		0.0144	0.0144		0.0132	0.0132	0.0000	35.8861	35.8861	0.0116	0.0000	36.1763
Total	**0.0258**	**0.2389**	**0.2907**	**4.1000e-004**		**0.0144**	**0.0144**		**0.0132**	**0.0132**	**0.0000**	**35.8861**	**35.8861**	**0.0116**	**0.0000**	**36.1763**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.6700e-003	5.0600e-003	0.0716	2.1000e-004	0.0247	1.5000e-004	0.0248	6.5500e-003	1.3000e-004	6.6800e-003	0.0000	19.4632	19.4632	4.7000e-004	4.7000e-004	19.6165
Total	**6.6700e-003**	**5.0600e-003**	**0.0716**	**2.1000e-004**	**0.0247**	**1.5000e-004**	**0.0248**	**6.5500e-003**	**1.3000e-004**	**6.6800e-003**	**0.0000**	**19.4632**	**19.4632**	**4.7000e-004**	**4.7000e-004**	**19.6165**

3.5 Trenching - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0258	0.2389	0.2907	4.1000e-004		0.0144	0.0144		0.0132	0.0132	0.0000	35.8861	35.8861	0.0116	0.0000	36.1762
Total	**0.0258**	**0.2389**	**0.2907**	**4.1000e-004**		**0.0144**	**0.0144**		**0.0132**	**0.0132**	**0.0000**	**35.8861**	**35.8861**	**0.0116**	**0.0000**	**36.1762**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.6700e-003	5.0600e-003	0.0716	2.1000e-004	0.0247	1.5000e-004	0.0248	6.5500e-003	1.3000e-004	6.6800e-003	0.0000	19.4632	19.4632	4.7000e-004	4.7000e-004	19.6165
Total	**6.6700e-003**	**5.0600e-003**	**0.0716**	**2.1000e-004**	**0.0247**	**1.5000e-004**	**0.0248**	**6.5500e-003**	**1.3000e-004**	**6.6800e-003**	**0.0000**	**19.4632**	**19.4632**	**4.7000e-004**	**4.7000e-004**	**19.6165**

3.6 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1186	0.9238	1.0452	1.8400e-003		0.0376	0.0376		0.0363	0.0363	0.0000	151.6454	151.6454	0.0253	0.0000	152.2768
Total	**0.1186**	**0.9238**	**1.0452**	**1.8400e-003**		**0.0376**	**0.0376**		**0.0363**	**0.0363**	**0.0000**	**151.6454**	**151.6454**	**0.0253**	**0.0000**	**152.2768**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.3507	0.1282	1.5900e-003	0.0547	1.6900e-003	0.0564	0.0158	1.6200e-003	0.0174	0.0000	155.5255	155.5255	5.3000e-003	0.0224	162.3343
Worker	0.1905	0.1447	2.0459	5.9400e-003	0.7045	4.1600e-003	0.7087	0.1871	3.8300e-003	0.1910	0.0000	556.1711	556.1711	0.0135	0.0136	560.5523
Total	**0.2000**	**0.4953**	**2.1742**	**7.5300e-003**	**0.7593**	**5.8500e-003**	**0.7651**	**0.2029**	**5.4500e-003**	**0.2084**	**0.0000**	**711.6966**	**711.6966**	**0.0188**	**0.0360**	**722.8866**

3.6 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1186	0.9238	1.0452	1.8400e-003		0.0376	0.0376		0.0363	0.0363	0.0000	151.6452	151.6452	0.0253	0.0000	152.2766
Total	**0.1186**	**0.9238**	**1.0452**	**1.8400e-003**		**0.0376**	**0.0376**		**0.0363**	**0.0363**	**0.0000**	**151.6452**	**151.6452**	**0.0253**	**0.0000**	**152.2766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.3507	0.1282	1.5900e-003	0.0547	1.6900e-003	0.0564	0.0158	1.6200e-003	0.0174	0.0000	155.5255	155.5255	5.3000e-003	0.0224	162.3343
Worker	0.1905	0.1447	2.0459	5.9400e-003	0.7045	4.1600e-003	0.7087	0.1871	3.8300e-003	0.1910	0.0000	556.1711	556.1711	0.0135	0.0136	560.5523
Total	**0.2000**	**0.4953**	**2.1742**	**7.5300e-003**	**0.7593**	**5.8500e-003**	**0.7651**	**0.2029**	**5.4500e-003**	**0.2084**	**0.0000**	**711.6966**	**711.6966**	**0.0188**	**0.0360**	**722.8866**

3.6 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0748	0.5883	0.7028	1.2500e-003		0.0222	0.0222		0.0214	0.0214	0.0000	102.6222	102.6222	0.0168	0.0000	103.0411
Total	**0.0748**	**0.5883**	**0.7028**	**1.2500e-003**		**0.0222**	**0.0222**		**0.0214**	**0.0214**	**0.0000**	**102.6222**	**102.6222**	**0.0168**	**0.0000**	**103.0411**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.2400e-003	0.2361	0.0852	1.0600e-003	0.0370	1.1500e-003	0.0382	0.0107	1.1000e-003	0.0118	0.0000	103.3425	103.3425	3.6100e-003	0.0149	107.8719
Worker	0.1207	0.0879	1.2910	3.8800e-003	0.4767	2.6800e-003	0.4794	0.1266	2.4700e-003	0.1291	0.0000	367.1546	367.1546	8.2500e-003	8.5700e-003	369.9153
Total	**0.1269**	**0.3241**	**1.3762**	**4.9400e-003**	**0.5138**	**3.8300e-003**	**0.5176**	**0.1373**	**3.5700e-003**	**0.1409**	**0.0000**	**470.4971**	**470.4971**	**0.0119**	**0.0235**	**477.7872**

3.6 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0748	0.5883	0.7028	1.2500e-003		0.0222	0.0222		0.0214	0.0214	0.0000	102.6221	102.6221	0.0168	0.0000	103.0410
Total	**0.0748**	**0.5883**	**0.7028**	**1.2500e-003**		**0.0222**	**0.0222**		**0.0214**	**0.0214**	**0.0000**	**102.6221**	**102.6221**	**0.0168**	**0.0000**	**103.0410**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.2400e-003	0.2361	0.0852	1.0600e-003	0.0370	1.1500e-003	0.0382	0.0107	1.1000e-003	0.0118	0.0000	103.3425	103.3425	3.6100e-003	0.0149	107.8719
Worker	0.1207	0.0879	1.2910	3.8800e-003	0.4767	2.6800e-003	0.4794	0.1266	2.4700e-003	0.1291	0.0000	367.1546	367.1546	8.2500e-003	8.5700e-003	369.9153
Total	**0.1269**	**0.3241**	**1.3762**	**4.9400e-003**	**0.5138**	**3.8300e-003**	**0.5176**	**0.1373**	**3.5700e-003**	**0.1409**	**0.0000**	**470.4971**	**470.4971**	**0.0119**	**0.0235**	**477.7872**

3.7 Paving - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0100	0.0932	0.1539	2.4000e-004		4.3100e-003	4.3100e-003		3.9800e-003	3.9800e-003	0.0000	20.6037	20.6037	6.5300e-003	0.0000	20.7670
Paving	5.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0106**	**0.0932**	**0.1539**	**2.4000e-004**		**4.3100e-003**	**4.3100e-003**		**3.9800e-003**	**3.9800e-003**	**0.0000**	**20.6037**	**20.6037**	**6.5300e-003**	**0.0000**	**20.7670**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.6000e-004	0.0211	7.6100e-003	9.0000e-005	3.3100e-003	1.0000e-004	3.4100e-003	9.6000e-004	1.0000e-004	1.0500e-003	0.0000	9.2333	9.2333	3.2000e-004	1.3300e-003	9.6380
Worker	4.8600e-003	3.5400e-003	0.0519	1.6000e-004	0.0192	1.1000e-004	0.0193	5.0900e-003	1.0000e-004	5.1900e-003	0.0000	14.7689	14.7689	3.3000e-004	3.4000e-004	14.8799
Total	**5.4200e-003**	**0.0246**	**0.0595**	**2.5000e-004**	**0.0225**	**2.1000e-004**	**0.0227**	**6.0500e-003**	**2.0000e-004**	**6.2400e-003**	**0.0000**	**24.0022**	**24.0022**	**6.5000e-004**	**1.6700e-003**	**24.5179**

3.7 Paving - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0100	0.0932	0.1539	2.4000e-004		4.3100e-003	4.3100e-003		3.9800e-003	3.9800e-003	0.0000	20.6037	20.6037	6.5300e-003	0.0000	20.7669
Paving	5.4000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0106**	**0.0932**	**0.1539**	**2.4000e-004**		**4.3100e-003**	**4.3100e-003**		**3.9800e-003**	**3.9800e-003**	**0.0000**	**20.6037**	**20.6037**	**6.5300e-003**	**0.0000**	**20.7669**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.6000e-004	0.0211	7.6100e-003	9.0000e-005	3.3100e-003	1.0000e-004	3.4100e-003	9.6000e-004	1.0000e-004	1.0500e-003	0.0000	9.2333	9.2333	3.2000e-004	1.3300e-003	9.6380
Worker	4.8600e-003	3.5400e-003	0.0519	1.6000e-004	0.0192	1.1000e-004	0.0193	5.0900e-003	1.0000e-004	5.1900e-003	0.0000	14.7689	14.7689	3.3000e-004	3.4000e-004	14.8799
Total	**5.4200e-003**	**0.0246**	**0.0595**	**2.5000e-004**	**0.0225**	**2.1000e-004**	**0.0227**	**6.0500e-003**	**2.0000e-004**	**6.2400e-003**	**0.0000**	**24.0022**	**24.0022**	**6.5000e-004**	**1.6700e-003**	**24.5179**

3.8 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.5584					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.8400e-003	0.0691	0.1182	1.9000e-004		2.6200e-003	2.6200e-003		2.5900e-003	2.5900e-003	0.0000	16.4687	16.4687	2.2400e-003	0.0000	16.5246
Total	**0.5673**	**0.0691**	**0.1182**	**1.9000e-004**		**2.6200e-003**	**2.6200e-003**		**2.5900e-003**	**2.5900e-003**	**0.0000**	**16.4687**	**16.4687**	**2.2400e-003**	**0.0000**	**16.5246**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9000e-004	7.2300e-003	2.6100e-003	3.0000e-005	1.1300e-003	4.0000e-005	1.1700e-003	3.3000e-004	3.0000e-005	3.6000e-004	0.0000	3.1657	3.1657	1.1000e-004	4.6000e-004	3.3045
Worker	6.2400e-003	4.5500e-003	0.0668	2.0000e-004	0.0247	1.4000e-004	0.0248	6.5500e-003	1.3000e-004	6.6800e-003	0.0000	18.9886	18.9886	4.3000e-004	4.4000e-004	19.1314
Total	**6.4300e-003**	**0.0118**	**0.0694**	**2.3000e-004**	**0.0258**	**1.8000e-004**	**0.0260**	**6.8800e-003**	**1.6000e-004**	**7.0400e-003**	**0.0000**	**22.1543**	**22.1543**	**5.4000e-004**	**9.0000e-004**	**22.4358**

3.8 Architectural Coating - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.5584					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.8400e-003	0.0691	0.1182	1.9000e-004		2.6200e-003	2.6200e-003		2.5900e-003	2.5900e-003	0.0000	16.4686	16.4686	2.2400e-003	0.0000	16.5246
Total	**0.5673**	**0.0691**	**0.1182**	**1.9000e-004**		**2.6200e-003**	**2.6200e-003**		**2.5900e-003**	**2.5900e-003**	**0.0000**	**16.4686**	**16.4686**	**2.2400e-003**	**0.0000**	**16.5246**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.9000e-004	7.2300e-003	2.6100e-003	3.0000e-005	1.1300e-003	4.0000e-005	1.1700e-003	3.3000e-004	3.0000e-005	3.6000e-004	0.0000	3.1657	3.1657	1.1000e-004	4.6000e-004	3.3045
Worker	6.2400e-003	4.5500e-003	0.0668	2.0000e-004	0.0247	1.4000e-004	0.0248	6.5500e-003	1.3000e-004	6.6800e-003	0.0000	18.9886	18.9886	4.3000e-004	4.4000e-004	19.1314
Total	**6.4300e-003**	**0.0118**	**0.0694**	**2.3000e-004**	**0.0258**	**1.8000e-004**	**0.0260**	**6.8800e-003**	**1.6000e-004**	**7.0400e-003**	**0.0000**	**22.1543**	**22.1543**	**5.4000e-004**	**9.0000e-004**	**22.4358**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2476	0.2584	2.3595	4.9400e-003	0.5357	3.6900e-003	0.5394	0.1429	3.4300e-003	0.1464	0.0000	468.2308	468.2308	0.0338	0.0209	475.3120
Unmitigated	0.2476	0.2584	2.3595	4.9400e-003	0.5357	3.6900e-003	0.5394	0.1429	3.4300e-003	0.1464	0.0000	468.2308	468.2308	0.0338	0.0209	475.3120

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Library	564.73	564.73	564.73	1,425,762	1,425,762
Parking Lot	0.00	0.00	0.00		
Total	564.73	564.73	564.73	1,425,762	1,425,762

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Library	16.60	8.40	6.90	52.00	43.00	5.00	44	44	12
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Library	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335
Parking Lot	0.540171	0.064547	0.189075	0.126673	0.023412	0.006384	0.010926	0.008089	0.000929	0.000597	0.025155	0.000706	0.003335

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	265.1142	265.1142	0.0224	2.7100e-003	266.4819
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	265.1142	265.1142	0.0224	2.7100e-003	266.4819
NaturalGas Mitigated	0.0133	0.1207	0.1014	7.2000e-004		9.1700e-003	9.1700e-003		9.1700e-003	9.1700e-003	0.0000	131.3717	131.3717	2.5200e-003	2.4100e-003	132.1524
NaturalGas Unmitigated	0.0133	0.1207	0.1014	7.2000e-004		9.1700e-003	9.1700e-003		9.1700e-003	9.1700e-003	0.0000	131.3717	131.3717	2.5200e-003	2.4100e-003	132.1524

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Library	2.46181e +006	0.0133	0.1207	0.1014	7.2000e-004		9.1700e-003	9.1700e-003		9.1700e-003	9.1700e-003	0.0000	131.3717	131.3717	2.5200e-003	2.4100e-003	132.1524
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0133**	**0.1207**	**0.1014**	**7.2000e-004**		**9.1700e-003**	**9.1700e-003**		**9.1700e-003**	**9.1700e-003**	**0.0000**	**131.3717**	**131.3717**	**2.5200e-003**	**2.4100e-003**	**132.1524**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Library	2.46181e +006	0.0133	0.1207	0.1014	7.2000e-004		9.1700e-003	9.1700e-003		9.1700e-003	9.1700e-003	0.0000	131.3717	131.3717	2.5200e-003	2.4100e-003	132.1524
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0133**	**0.1207**	**0.1014**	**7.2000e-004**		**9.1700e-003**	**9.1700e-003**		**9.1700e-003**	**9.1700e-003**	**0.0000**	**131.3717**	**131.3717**	**2.5200e-003**	**2.4100e-003**	**132.1524**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Library	1.4886e +006	263.9969	0.0223	2.7000e-003	265.3588
Parking Lot	6300	1.1173	9.0000e-005	1.0000e-005	1.1230
Total		**265.1142**	**0.0224**	**2.7100e-003**	**266.4819**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Library	1.4886e +006	263.9969	0.0223	2.7000e-003	265.3588
Parking Lot	6300	1.1173	9.0000e-005	1.0000e-005	1.1230
Total		**265.1142**	**0.0224**	**2.7100e-003**	**266.4819**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.5525	2.0000e-005	2.3200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.5200e-003	4.5200e-003	1.0000e-005	0.0000	4.8100e-003
Unmitigated	0.5525	2.0000e-005	2.3200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.5200e-003	4.5200e-003	1.0000e-005	0.0000	4.8100e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0558					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.4965					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.1000e-004	2.0000e-005	2.3200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.5200e-003	4.5200e-003	1.0000e-005	0.0000	4.8100e-003
Total	**0.5525**	**2.0000e-005**	**2.3200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.5200e-003**	**4.5200e-003**	**1.0000e-005**	**0.0000**	**4.8100e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0558					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.4965					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.1000e-004	2.0000e-005	2.3200e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.5200e-003	4.5200e-003	1.0000e-005	0.0000	4.8100e-003
Total	**0.5525**	**2.0000e-005**	**2.3200e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.5200e-003**	**4.5200e-003**	**1.0000e-005**	**0.0000**	**4.8100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	21.4222	0.1135	2.8500e-003	25.1088
Unmitigated	24.4813	0.1417	3.5400e-003	29.0777

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Library	4.28877 / 6.70808	24.4813	0.1417	3.5400e-003	29.0777
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**24.4813**	**0.1417**	**3.5400e-003**	**29.0777**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Library	3.43102 / 6.29888	21.4222	0.1135	2.8500e-003	25.1088
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**21.4222**	**0.1135**	**2.8500e-003**	**25.1088**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	25.6236	1.5143	0.0000	63.4813
Unmitigated	25.6236	1.5143	0.0000	63.4813

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Library	126.23	25.6236	1.5143	0.0000	63.4813
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**25.6236**	**1.5143**	**0.0000**	**63.4813**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Library	126.23	25.6236	1.5143	0.0000	63.4813
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**25.6236**	**1.5143**	**0.0000**	**63.4813**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX E

Noise and Vibration Assessment

taha
environmental planners

Technical Memorandum

TO: Jane Chang
AECOM

FROM: Terry A. Hayes Associates Inc.
3535 Hayden Avenue, Suite 350
Culver City, CA 90232

DATE: May 17, 2022

RE: **California State University, Long Beach (CSULB) Peterson Hall 1 Replacement Project – Noise and Vibration Assessment**

Introduction

Terry A. Hayes Associates Inc. (TAHA) has completed a Noise and Vibration Assessment for the California State University, Long Beach (CSULB) Peterson Hall 1 Replacement Project (proposed project) in accordance with provisions of California Environmental Quality Act (CEQA) Statutes and Guidelines. It is anticipated that this Assessment will be used to support a Tiered Mitigated Negative Declaration for the proposed project. This Assessment is organized as follows:

- Project Description
- Noise and Vibration Topical Information
- Regulatory Framework
- Significance Thresholds and Local Standards
- Methodology
- Existing Setting
- Impact Assessment
- References

Project Description

The proposed project is located in the City of Long Beach, California, specifically within the California State University, Long Beach (CSULB) property. **Figure 1** shows the project location in the City of Long Beach, **Figure 2** shows the location of the proposed project within the CSULB boundary, and **Figure 3** shows the conceptual site plan of the proposed project.

The existing Peterson Hall 1 (PH1) building was proposed for demolition and replacement in the Campus Master Plan and Campus Master Plan Update EIR, certified by the CSU Board of Trustees in May 2008 (2008 EIR). CSULB now proposes to implement this project with modifications compared to its original description in the 2008 Campus Master Plan, necessitating the preparation of additional environmental analysis and documentation in conformance with the California Environmental Quality Act (CEQA) Guidelines. All applicable mitigation measures from the 2008 EIR would be applicable to the proposed project.

Similar to the approved project, the current proposed project involves demolition of the existing PH1 building and temporary Faculty Office 5 (FO5) building as well as construction of a new building. In the time since the 2008 EIR, Peterson Hall 2 (PH2) has undergone a renovation, which included a small addition, rather than the originally contemplated replacement of the PH2 building. As such, PH2 would remain in use and is not part of the current proposed project. The 2008 Campus Master Plan proposed two new buildings to accommodate replacement lecture and laboratory space as well as approximately 170 faculty offices. Instead of constructing two new replacement buildings as contemplated in the 2008 EIR, the proposed project would construct one new three-story building. The proposed building would include lecture and lab space, as well as faculty offices, similar to the approved project.

In addition, the proposed project would include uses not originally contemplated in the 2008 EIR, including a public clinic to be operated in cooperation with a local Clinical Healthcare provider partner (clinical partner), under a teaching clinic model. The proposed project would also require demolition of the Faculty Office 4 (FO4) temporary building to accommodate a surface parking lot to serve the clinic, which was not originally contemplated for the approved project.

The proposed project site includes the existing PH1 building, FO4, FO5, and construction laydown and equipment storage areas, and is located in the southern portion of the campus, as shown in **Figure 2**. The proposed project would construct a new 137,072 gross square feet, three-story building for the College of Health and Human Services (CHHS) to replace the existing PH1 building, and the FO4 and FO5 temporary office buildings. The replacement facility would occupy the PH1 and FO5 building footprints. FO4 would become future additional surface parking.

The new building would include faculty space, student collaboration space, teaching labs, research labs, administration space, a medical simulation center, and a clinic to be operated in cooperation with a local regional hospital. Office construction would implement the CSULB office space standards of 90 ASF for faculty offices, which would provide the equivalent of 134 new faculty offices. The replacement building would be open to students during normal academic hours as well as evenings and weekends to support academic scheduling and student self-study needs.

The clinic would be based on a “teaching-clinic model” and would be located on the first floor of the replacement building. The clinic would operate Monday through Friday from 8:00 a.m. to 5:00 p.m. and would not have an urgent care component. FO4 would be demolished and replaced with a surface parking lot that would provide approximately 45 new dedicated parking spaces for the clinic, which would be available for use by the campus outside of clinic hours.

Construction of the proposed project is anticipated to take approximately 24 months to complete, commencing in September 2023 and concluding in September 2025.

Figure 1
Regional Map

Figure 2

Project Location Map

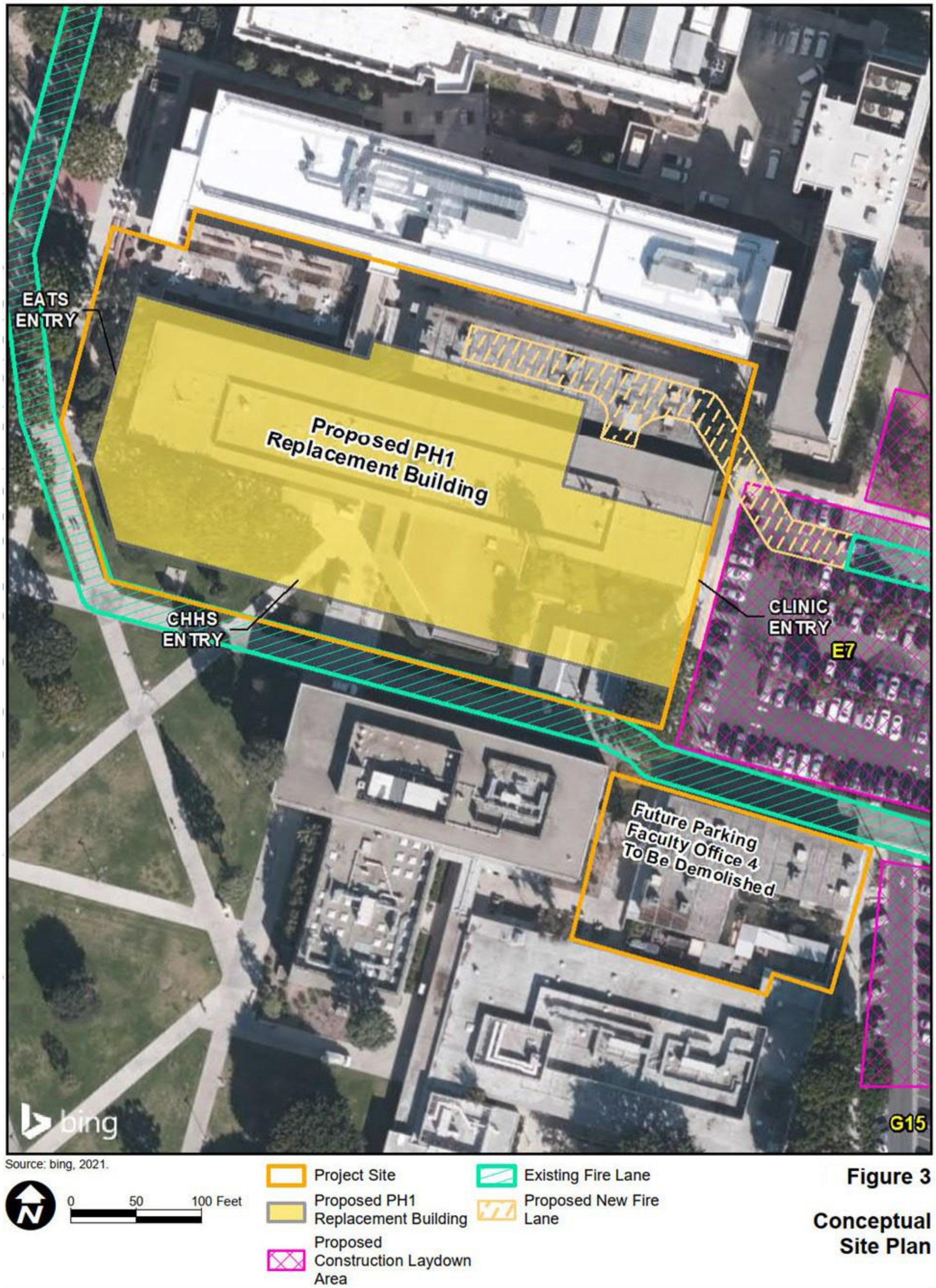


Figure 3

Conceptual Site Plan

Noise and Vibration Topical Information

The standard unit of measurement for noise is the decibel (dB). The human ear is not equally sensitive to sound at all frequencies. The A-weighted scale, abbreviated dBA, reflects the normal hearing sensitivity range of the human ear. On this scale, the range of human hearing extends from approximately 3 to 140 dBA. The noise analysis discusses sound levels in terms of Equivalent Noise Level (L_{eq}), L_{50} and Community Noise Equivalent Level (CNEL). L_{eq} is the average noise level on an energy basis for any specific time period. The L_{eq} for one hour is the energy average noise level during the hour. The average noise level is based on the energy content (acoustic energy) of the sound. L_{eq} can be thought of as the level of a continuous noise which has the same energy content as the fluctuating noise level. L_{50}, is the noise level for 30 minutes within any hour. The L_{eq} and L_{50} are expressed in units of dBA.

CNEL is an average sound level during a 24-hour period. CNEL is a noise measurement scale, which accounts for noise source, distance, single event duration, single event occurrence, frequency, and time of day. Human reaction to sound between 7:00 pm and 10:00 pm is as if the sound were actually 5 dBA higher than if it occurred from 7:00 am to 7:00 pm. From 10:00 pm to 7:00 am, humans perceive sound as if it were 10 dBA higher due to the lower background level. Hence, the CNEL is obtained by adding an additional 5 dBA to sound levels in the evening from 7:00 pm to 10:00 pm and 10 dBA to sound levels in the night from 10:00 pm to 7:00 am. Because CNEL accounts for human sensitivity to sound, the CNEL is always a higher number than the actual 24-hour average. The Day-night (L_{dn}) noise level is similar to CNEL, but only includes a 10 dBA sensitivity adjustment for the hours of 10:00 pm to 7:00 am

Noise levels decrease as the distance from the noise source to the receiver increases. Noise generated by a stationary noise source, or "point source," decreases by approximately 6 dBA over hard surfaces (e.g., reflective surfaces such as parking lots or smooth bodies of water) and 7.5 dBA over soft surfaces (e.g., absorptive surfaces such as soft dirt, grass, or scattered bushes and trees) for each doubling of the distance. For example, if a noise source produces a noise level of 89 dBA at a reference distance of 50 feet, then the noise level is 83 dBA at a distance of 100 feet from the noise source, 77 dBA at a distance of 200 feet over a hard surface.

Noise generated by a mobile source decreases by approximately 3 dBA over hard surfaces and 4.8 dBA over soft surfaces for each doubling of the distance. Generally, noise is most audible when the source is in a direct line-of-sight of the receiver. Barriers, such as walls, berms, or buildings that break the line-of-sight between the source and the receiver greatly reduce noise levels from the source since sound can only reach the receiver by bending over the top of the barrier. However, if a barrier is not sufficiently high or long to break the line-of-sight from the source to the receiver, its effectiveness is greatly reduced.

Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 dBA. A change of at least 5 dBA would be noticeable and may evoke a community reaction. A 10-dBA increase is subjectively heard as a doubling in loudness and would likely cause a negative community reaction.

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. In contrast to noise, vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of vibration are trains, buses on rough roads, and construction activities, such as rock blasting, pile driving, and heavy earth-moving equipment. High levels of vibration may cause physical personal injury or damage to buildings. However, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that may affect concentration or disturb sleep. In addition, high levels of vibration may damage fragile buildings or interfere with equipment that is highly sensitive to vibration (e.g., electron microscopes).

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings and is usually measured in inches per second. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The VdB acts to compress the range of numbers required to describe vibration.[1]

Regulatory Framework

The following discussion includes relevant regulations, policies, and programs that have been adopted by federal, state, regional, and local agencies to protect the public from noise and vibration

Noise

Federal. The Noise Control Act of 1972 established programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In 1981, the United States Environmental Protection Agency (USEPA) determined that subjective issues such as noise would be better addressed at local levels of government, thereby allowing more individualized control for specific issues by designated federal, state, and local government agencies. Consequently, in 1982, responsibilities for regulating noise control policies were transferred to specific federal agencies, and state and local governments. However, noise control guidelines and regulations contained in the USEPA rulings in prior years remain in place.

State. The State of California has adopted noise standards in areas of regulation not preempted by the federal government. State standards regulate noise levels of motor vehicles, sound transmission through buildings, occupational noise control, and noise insulation. State regulations governing noise levels generated by individual motor vehicles and occupational noise control are not applicable to planning efforts, nor are these areas typically subject to CEQA analysis.

The State Office of Planning and Research Noise Element Guidelines include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The OPR Guidelines contain a land use compatibility table that describes the compatibility of different land uses with a range of environmental noise levels in terms of CNEL. A noise environment up to 70 dB CNEL is considered conditionally acceptable for residential, school, and park uses according to those guidelines. At office building, business, commercial, and professional land uses, a CNEL of up to 77.5 dB is considered to be conditionally acceptable. For industrial land uses, a CNEL of up to 80 dB is considered conditionally acceptable.

Local. CSULB has not developed noise standards relevant to the CEQA analysis. The City of Long Beach has established policies and regulations concerning the generation and control of noise that could adversely affect its citizens and noise-sensitive land uses. Chapter 8.80 of the City of Long Beach Municipal Code (LBMC) sets forth all noise regulations controlling unnecessary, excessive, and annoying noise and vibration in the City. The LBMC has not established a quantitative standard for construction noise, which is instead regulated by allowable hours of construction. LBMC Section 8.80.202 (Construction Activity – Noise Regulations) states

[1] Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment*, September 2018.

that no construction or repair work shall be performed between the hours of 7:00 pm and 7:00 am on Monday through Friday and federal holidays occurring on weekdays, since such activities would generate loud noises and disturb persons occupying sleeping quarters in any adjacent dwelling, hotel, apartment, or other place of residence. Further, no person shall operate or permit the operation of any tools or equipment which produce loud or unusual noise between the hours of 7:00 pm on Friday and 9:00 am on Saturday and after 6:00 pm on Saturday. No person shall conduct construction work on Sunday. A Sunday work permit may be issued by the Noise Control Officer, but only for the hours between 9:00 am and 6:00 pm.

Section 8.80.150 of the LBMC states that exterior noise standards are based on various land use districts and are presented in Section 8.80.160. The proposed project and its immediate surrounding area are located in Noise District One. **Table 1** summarizes the applicable standards for Noise District One. LBMC Section 8.80.160 (C) states that if the measured ambient noise level exceeds the permissible noise limit categories, then the allowable noise exposure standard shall be increased by increments of 5 dB.

TABLE 1: CITY OF LONG BEACH EXTERIOR NOISE LIMITS (DISTRICT ONE)

Allowable Noise Exposure Duration	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
30 Minutes (L_{50})	50 dBA	45 dBA
15 Minutes	55 dBA	50 dBA
5 Minutes	60 dBA	55 dBA
1 Minute	65 dBA	60 dBA
Any period of time	70 dBA	65 dBA

SOURCE: LBMC, *Section 8.80.160 Exterior Noise Limits – Correction for Character of Sound*.

LBMC Section 8.20.200 (N) (Noise Disturbances – Acts Specific) states that air-conditioning or refrigerating equipment shall not exceed 55 dBA at the nearest property line, 50 dBA at a neighboring patio, or 50 dBA outside the neighboring living area window nearest the equipment location.

Vibration

CSULB has not developed vibration standards relevant to the CEQA analysis. The City has established significance thresholds related to vibration. Section 8.80.200 (G) of the LBMC states that it is a violation to operate or permit the operation of a device that creates vibration which is above the vibration threshold at or beyond the property boundary of the source if on private property or at 150 feet from the source if on public space. The vibration perception threshold is defined as the minimum groundborne vibration necessary to cause a normal person to be aware of the vibration by means such as feeling the vibration or observing vibration-induced motion of other objects. The vibration threshold is approximately 0.001 g's (acceleration from gravity) in the 0 to 30 hertz frequency range which is approximately 65 VdB. The Federal Transit Administration (FTA) guidance may be used to assess the potential for vibration-related damage and annoyance.[2] For damage, the impact criteria are established based on the structural foundation of the potentially impacted building. Site visits indicate that the buildings near the project site are constructed with non-engineered timber and masonry. Vibration levels that exceed a PPV of 0.2 inches per second could potentially damage these types of buildings.

[2]Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment*, September 2018.

Significance Thresholds

This Assessment was undertaken to determine whether construction or operation of the proposed project would have the potential to result in significant environmental impacts related to noise or vibration in the context of the Appendix G Environmental Checklist criteria of the CEQA Guidelines. Implementation of the proposed project may result in a significant environmental impact related to noise and vibration if the proposed project would result in:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
b) Generation of excessive ground-borne vibration or ground-borne noise levels; and/or
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

CSULB is not obligated to abide by the standards in the LBMC, although they are considered in this Assessment as a method for establishing the potential for impacts. The proposed project would exceed the local standards and increase temporary construction noise levels if construction activities would occur within 500 feet of a noise-sensitive use and outside the hours allowed in the LBMC. LBMC Section 8.80.202 states that the allowable hours of construction are Monday through Friday 7:00 am to 7:00 pm, Saturday from 9:00 am to 6:00 pm, and no construction on Sundays unless a Sunday work permit was granted by the City's Noise Control Officer.

For construction noise, a 5 dBA increase over the ambient noise level would be considered a significant impact.

For permanent operational noise, a significant impact would result if the proposed project would exceed the exterior noise standards set forth in LBMC Section 8.80.160. For transportation noise sources the noise level due to project-generated traffic increases the CNEL from below 70 dB to above 70 dB at any existing residential property, school, or park.

A vibration impact would occur if vibration levels generated by the proposed project would exceed the 0.2 inches per second vibration damage criterion or the 65 VdB vibration perception threshold.

Methodology

Noise

The noise and vibration analysis consider construction and operational sources. Noise levels associated with typical construction equipment were obtained from the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM).[3] This model predicts noise from construction based on a compilation of empirical data and the application of acoustical propagation formulas. Maximum equipment noise levels were adjusted based on anticipated percent of use. Combined construction activity noise levels were estimated by combining anticipated equipment for each activity using RCNM. The projected noise level during the construction period at receptors was calculated by making a distance adjustment to the construction source sound level.

[3]FHWA, *Roadway Construction Noise Model*, Version 1.1, August 2008.

According to Caltrans guidance, air temperature and humidity affect molecular absorption differently depending on the frequency spectrum and can vary significantly over long distances in a complex manner. Molecular absorption in air also reduces noise levels with distance. According to Caltrans, this process only accounts for about 1 dBA per 1,000 feet, which is an inaudible and negligible difference in noise levels. Noise levels have been estimated using a decrease of 6 dBA over hard surfaces for each doubling of the distance. The methodology and formulas obtained from the Caltrans Technical Noise Supplement can be viewed below.

Noise Distance Attenuation Formula: $dBA_2 = dBA_1 + 20 \times LOG_{10} (D_1/D_2)$

Where:

dBA_1 = *Noise level at the reference distance of 50 feet*

dBA_2 = *Noise level at the receptor*

D_1 = *Reference distance (50 feet)*

D_2 = *Distance from source to receptor (measured distance)*

Operational stationary noise related to HVAC equipment noise and parking lot activity noise was assessed for operation of the proposed project. Operational mobile noise was assessed the FHWA's Traffic Noise Model. Existing measured noise levels were compared to predicted noise levels associated with project trips.

Vibration

Vibration levels generated by construction equipment were estimated using example vibration levels and propagation formulas provided by FTA.[4] The following formula was used to assess potential vibration damage at nearby structures.

Vibration Damage Attenuation Formula: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

Where:

PPV_{equip} = *Peak particles velocity in inches per second of the equipment adjusted for distance*

PPV_{ref} = *Reference vibration level in inches per second at 25 feet*

D = *Distance from the equipment to the receptor in feet*

The following formula was used to assess potential vibration annoyance at nearby structures.

Vibration Annoyance Attenuation Formula: $Lv_{distance} = Lv_{ref} - 30 \times LOG_{10}(D/25)$

Where:

[4]Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018.

$Lv_{distance}$ = the rms velocity level of the equipment adjusted for distance in VdB

lv_{ref} = Reference vibration level in VdB at 25 feet

D = Distance from the equipment to the receptor in feet

Existing Setting

The project site is within the CSLUB property and the land is categorized as institutional use. A gated community of single-family residences are located to the east of the project site. East Campus Drive divides CSULB property to the west from the residences to the east. Sensitive receptors are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. They typically include residences, schools, hospitals, guest lodging, and libraries. The nearest sensitive receptors are single-family residences approximately 100 feet east from the project site.

To characterize the existing noise environment around the project site, short-term (ST) noise measurements were taken using a SoundPro DL Sound Level Meter. Short-term noise measurements were conducted on Tuesday, November 30, 2021, from 9:30 a.m. to 11:30 a.m., in 15-minute increments. This time of day represents a typical construction time without the added noise source of peak hour traffic. Short-term monitored noise levels ranged from 62.2 to 74.3 dBA L_{eq}. Traffic noise along nearby roadways were the primary sources of noise in the project area. Monitoring locations are shown in **Figure 4** and monitored noise levels are shown in **Table 2**.

TABLE 2: EXISTING AMBIENT NOISE LEVELS

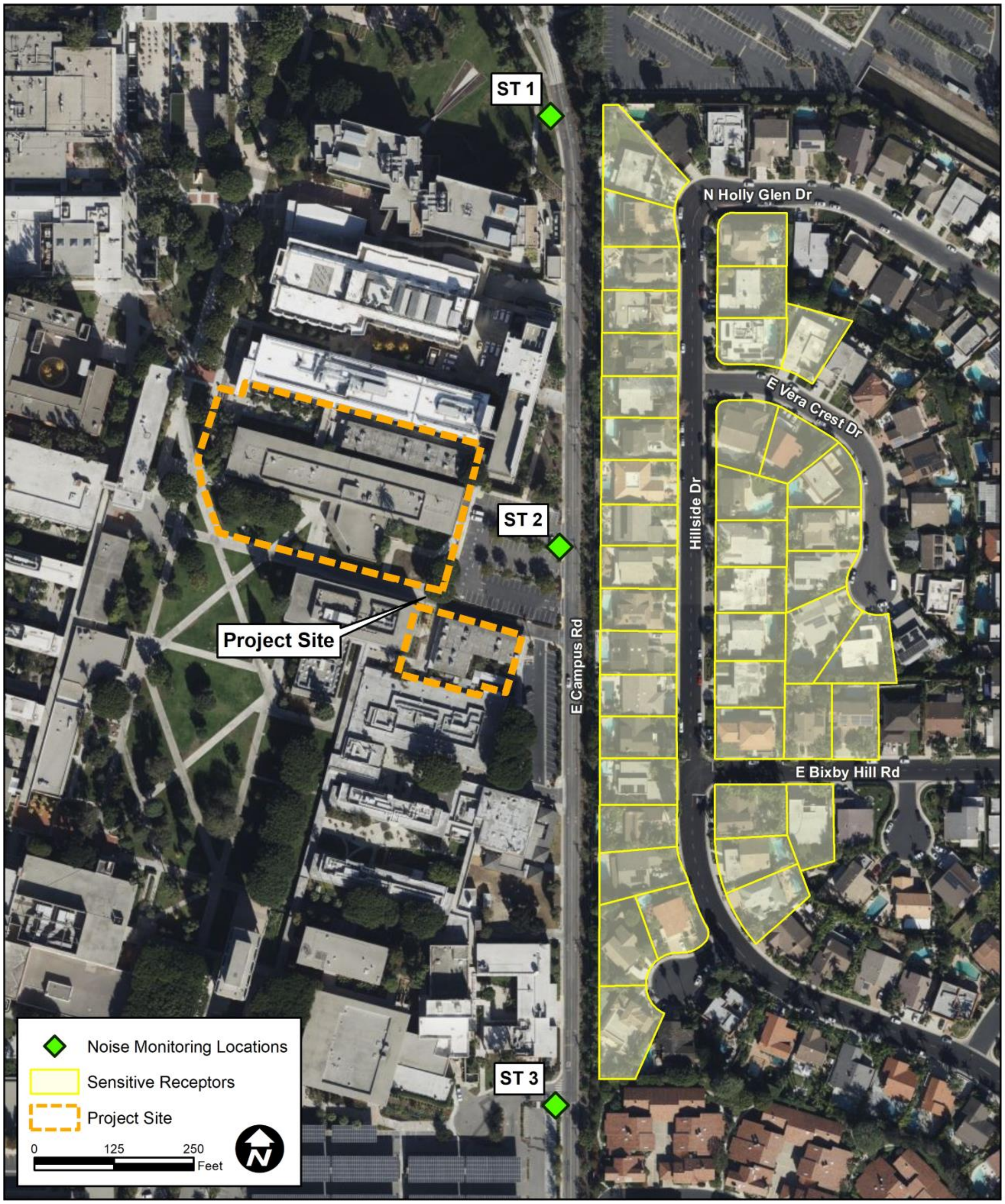
Noise Measurement Site (Figure 4)	Noise Monitoring Location	Noise Level (dBA, L_{eq})	Noise Level (dBA, L_{50})
ST-1	Hardfact Hill along East Campus Dr.	64.0	54.9
ST-2	E7 Parking Lot adjacent to Peterson Hall 1, along East Campus Dr.	62.2	54.7
ST-3	E8 Parking Lot along East Campus Dr.	74.3	58.0
SOURCE: TAHA, 2021.			

Consistent with the 2008 Campus Master Plan EIR, the significance threshold for construction noise is an increase of 5 dBA or more over the existing ambient noise level. Ambient noise levels were averaged along East Campus Drive to provide a common standard for sensitive receptors located adjacent to East Campus Drive. Existing noise levels for sensitive receptors to the east of East Campus Drive were distance adjusted to account for lower noise levels that would be experienced by second and third row sensitive receptors. Existing noise levels, their adjustments, and applicable sensitive receptors are shown in **Table 3**.

TABLE 3: ADJUSTED EXISTING NOISE LEVELS FOR IMPACT ANALYSIS

Sensitive Receptor	Adjustment to Existing Noise Level /a/	Existing Noise Level (dBA, L_{eq})
Residences along Hillside Dr. to the east	Average of ST-1 and ST-2	63.1
Residences along Hillside Dr. to the east	Average of ST-1 and ST-2	63.1
Residences along Hillside Dr. to the east	Average of ST-1 and ST-2	63.1
Residences along Hillside Dr. to the east	Average of ST-1 and ST-2	63.1
Residences along Hillside Dr. to the east	Distance adjusted	54.2
Residences along E. Vera Crest Dr. to the east	Distance adjusted	50.7

/a/ ST-3 was not included in the average for noise levels as it was significantly louder at the southern end of East Campus Dr.
SOURCE: TAHA, 2021.



Source: TAHA, 2022.

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TAHA 2020-100

CSULB Peterson Hall 1 Replacement Project
Noise and Vibration Assessment

AECOM

FIGURE 4

NOISE MONITORING LOCATIONS AND SENSITIVE RECEPTORS

Impact Assessment

a) Would the proposed project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? (Less-than-Significant with Mitigation Incorporated)

Construction

Construction activity would result in temporary increases in ambient noise levels in the area surrounding the project site on an intermittent basis. Noise levels from the construction of the proposed project would fluctuate depending on the construction phase, equipment type and duration of use, distance between the noise source and receptor, and presence or absence of noise attenuation barriers. Construction activities typically require the use of numerous pieces of noise-generating equipment. Typical noise levels from various types of equipment that would be used during construction are listed in **Table 4**. Due to the size of the project site, it is anticipated that only one or two pieces of equipment would be operated at a time. The combined noise levels shown in **Table 4** take into account the likelihood that up to two of the loudest pieces of construction equipment in that phase would be operating simultaneously. Noise levels would typically range from 73.7 to 84.5 dBA L_{eq} for each phase. When considered as an entire process with multiple pieces of equipment, demolition would generate the loudest noise level at approximately 84.5 dBA L_{eq} at 50 feet.

Construction activities would occur Monday through Friday, and workers would typically be onsite from 7:00 am to 5:00 pm. Construction on Saturdays from 8:00 am to 4:00 pm would occur as needed through key milestones throughout the project. The LBMC has not established a quantitative standard for construction noise specifically, which is instead regulated by allowable hours of construction set forth in LBMC Section 8.80.202. Construction activity would therefore comply with the allowable hours of construction in the LBMC, which are 7:00 am to 7:00 pm Monday through Friday. Construction on Saturdays would sometimes occur 9:00 am to 6:00 pm on Saturday outside of the allowable times of the LBMC, but would not be a regular occurrence. CSLUB is not required to comply with the LBMC, but would apply all best practices to apply where feasible.

Construction noise has been assessed at off-campus uses and are shown in **Table 5**. The nearest off campus uses, and sensitive receptors are residences along Hillside Drive located approximately 100 feet east of the project site. The nearest hospital building, the VA Long Beach Healthcare System, is located approximately 900 feet to the west and would not be affected by construction noise related to the proposed project. Due to the small size of the project site, it is anticipated that only one or two pieces of equipment would be operated at a time. Demolition activity would likely be the loudest phase of construction, which would utilize a concrete saw and tractor. A concrete saw and a tractor would generate a noise level of 84.5 dBA L_{eq} at 50 feet and would be used as the reference construction noise level. The existing noise level at the nearest sensitive receptor is approximately 62.2 dBA L_{eq}. At a distance of 100 feet, demolition activity would generate a noise level of 78.5 dBA L_{eq} at the nearest sensitive receptor prior to the implementation of mitigation measures. A significant impact would occur if the existing noise level was exceeded by 5 dBA or more. As shown in **Table 5**, several sensitive receptors would experience noise levels 5 dBA or more over the existing noise level.

TABLE 4: PHASED CONSTRUCTION NOISE LEVELS	
Construction Equipment	**Noise Level at 50 feet (dBA, L_{eq})**
DEMOLITION	
Concrete Saw	82.6
Tractor	80.0
Dozer	77.7
Front End Loader	75.1
Backhoe	73.6
Combined Demolition Noise	**84.5**
SITE PREPARATION	
Grader	81.0
Dozer	77.7
Backhoe	73.6
Combined Site Preparation Noise	**82.7**
GRADING	
Grader	81.0
Dozer	77.7
Backhoe	73.6
Combined Grading Noise	**82.7**
TRENCHING	
Trencher	77.3
Excavator	76.7
Front End Loader	75.1
Backhoe	73.6
Combined Trenching Noise	**80.0**
BUILDING CONSTRUCTION	
Generator	77.6
Backhoe	73.6
Crane	72.6
Welder	70.0
Forklift	63.2
Combined Building Construction Noise	**79.1**
PAVING	
Cement and Mortar Mixers	77.0
Paver	74.2
Backhoe	73.6
Roller	73.0
Combined Paving Noise	**78.8**
ARCHITECTURAL COATING	
Air Compressor	73.7
Combined Architectural Coating Noise	**73.7**
SOURCE: Federal Highway Administration, Roadway Construction Noise Model, Version 1.1, 2008; Noise Levels of Lift Trucks, 25 May 2001, rigolett.home.xs4all.nl/ENGELS/equipment/liftfr.htm.	

TABLE 5: CONSTRUCTION NOISE LEVELS AT SENSITIVE RECEPTORS						
Sensitive Receptors	**Distance (feet)**	**Intervening Building /a/**	**Existing Noise Level (dBA, L_{eq})**	**Max Construction Noise Level (dBA, L_{eq})**	**Increase Over Existing (dBA, L_{eq})**	**Impact (5 dBA over Existing)?**
Residences along Hillside Dr. to the east	100	0	63.1	78.5	15.4	**Yes**
Residences along Hillside Dr. to the east	200	0	63.1	72.5	9.4	**Yes**
Residences along Hillside Dr. to the east	280	4.5	54.1	65.0	10.9	**Yes**
Residences along Hillside Dr. to the east	300	0	63.1	68.9	5.8	**Yes**
Residences along Hillside Dr. to the east	400	0	63.1	66.4	3.3	No
Residences along E. Vera Crest Dr. to the east	415	6	50.7	60.1	9.4	**Yes**

/a/ -4.5 dB for on intervening row of buildings and -1.5 dB for each subsequent row.
SOURCE: TAHA, 2022.

CSULB would initiate standard best management practices to control noise at off-campus uses. These include installing temporary barriers around the project site that help control noise (Mitigation Measure **PN1**), requiring the construction contractor to use engine mufflers consistent with manufacturers' standards (Mitigation Measure **N1**), and requiring all equipment to be properly maintained to assure that no additional noise due to worn or improperly maintained parts would be generated at the project site (Mitigation Measure **N2**). **Table 6** shows noise levels at sensitive receptors after the utilization of mufflers and temporary noise barriers. Implementation of Mitigation Measures **N1** through **N5** and **PN1** would reduce construction noise levels to a less than significant level. Construction noise would be temporary and intermittent and noise levels could be lower than expected. The majority of construction activity would be conducted within the allowable hours of construction set forth in LBMC Section 8.80.202. CSULB is not obligated to abide by the standards in the LBMC, but would as best practice abide by the LBMC as much as possible. Impacts related to on-site construction noise would be less than significant with mitigation incorporated. Therefore, the proposed project's on-site construction noise impacts would be less impactful that the significant and unavoidable impact that was identified in the Campus Master Plan EIR. The proposed project would not result in any new or substantially increased environmental impacts beyond those disclosed in the Campus Plan EIR.

TABLE 6: MITIGATED CONSTRUCTION NOISE LEVELS AT SENSITIVE RECEPTORS							
Sensitive Receptors	**Distance (feet)**	**Intervening Building /a/**	**Mitigated Noise Level /b/**	**Existing Noise Level (dBA, L_{eq})**	**Max Construction Noise Level (dBA, L_{eq})**	**Increase over Existing (dBA, L_{eq})**	**Impact (5 dBA over Existing)?**
Residences along Hillside Dr. to the east	100	0	69.5	63.1	63.5	0.4	No
Residences along Hillside Dr. to the east	200	0	69.5	63.1	57.5	-5.6	No
Residences along Hillside Dr. to the east	280	4.5	69.5	54.1	50.0	-4.1	No
Residences along Hillside Dr. to the east	300	0	69.5	63.1	53.9	-9.2	No
Residences along Hillside Dr. to the east	400	0	69.5	63.1	51.4	-11.7	No
Residences along E. Vera Crest Dr. to the east	415	6	69.5	50.7	45.1	-5.6	No

/a/ -4.5 dB for on intervening row of buildings and -1.5 dB for each subsequent row.
/b/ Mitigation Measures include a 5 dB reduction from equipment mufflers and a 10 dB reduction for temporary noise barriers.
SOURCE: TAHA, 2022.

The project site is adjacent to the CSULB College of Liberal Arts, School of Art, and Peterson Hall 2. Having complete control of the proposed project, CSULB has the ability to adjust construction activities to avoid disrupting academic activities. If construction noise were to disrupt activities at nearby classrooms, offices, laboratories, or other CSULB facilities, CSULB would work with the construction contractor to reduce noise levels. The actions may include avoiding heavy-duty equipment use during academic activities and temporarily relocating affected uses.

Operations

Operational sources of noise would include mechanical equipment such as heating, ventilation, and air conditioning (HVAC), parking activity, and off-site mobile noise. Conversational noise would mostly occur within the proposed building and would not be audible at off-site uses.

HVAC equipment noise would not exceed HVAC exterior noise standards at any nearby sensitive receptors. HVAC equipment would be located on the rooftop of the proposed PH1 replacement building. The distance between the rooftop of the proposed PH1 replacement building and the nearest sensitive receptors is approximately 200 feet. HVAC equipment would generate a noise level of 50.0 dBA L_{eq} at 50 feet.[5] At 200 feet, HVAC noise levels would approximately be 37.7 dBA L_{eq} and would not exceed the 55.0 dBA threshold

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[5] Daikin Air Intelligence, *Base Efficient Air Conditioner Packaged Rooftop Unit DBC Commercial 7.5 – 12.5 Nominal Tons*, available at https://budgetheating.com/v/vspfiles/downloadables/DBC%20Series%207.5-12.5%20Tons%20Technical%20Specifications.pdf.

for HVAC equipment noise measured at the property line, set forth in LBMC Section 8.20.200. HVAC equipment would be similar to existing equipment at PH1, FO4, and FO5 and would not represent a substantial change in existing noise conditions. Therefore, the proposed project would result in a less-than-significant impact related to HVAC equipment noise.

Parking activity would also be a source of noise. Sources of noise would include engines accelerating, doors slamming, car alarms, and people talking. It is anticipated that vehicle speeds on the project site would not exceed 10 miles per hour. FO4 temporary building would be demolished and replaced with a surface parking lot that would provide approximately 45 new dedicated parking spaces for the clinic, which would be available for use by the campus outside of clinic hours. Parking activity noise was calculated based upon a reference noise level of 56.4 dBA L_{eq} at 50 feet for a 1,000-parking space parking garage.[6] The noise level was adjusted using guidance provided by the Federal Transit Administration Transit Noise and Vibration Impact Assessment guidance and a maximum volume of 45 trips per hour, as estimated based on the number of new dedicated parking spaces. The resultant noise level of parking activity at a distance of 100 feet at the nearest sensitive receptor would approximately be 36.9 dBA L_{eq}, which would be lower than the existing noise level of 62.2 dBA L_{eq}. The appropriate LBMC standard would be 55 dBA L_{50}, which is established by the existing noise level of 54.9 and 54.7 dBA L_{50}, which would not be exceeded by project parking noise. The temporary surge parking spaces would be located within the interior of the campus and would not generate audible noise at off-site sensitive receptors. Furthermore, parking activity noise generated by the proposed project would be similar to the noise levels generated by the existing E7 parking lot, and quieter than the larger existing E8 parking lot to the south of the project site. Therefore, the proposed project would result in a less-than-significant impact related to parking noise.

The proposed project would generate approximately 564 daily vehicle trips, including 52 AM peak hour trips and 63 PM peak hour trips. The trip generation includes trips from the clinic staff, clinic patients, CSULB students, and CSULB employees. Operational mobile noise was assessed using the FHWA Traffic Noise Model Version 3.1 (TNM 3.1). Mobile noise levels were modeled for each noise monitoring location. Conservatively, PM peak hour trips, which represent the highest volume of trips over an hour, were modeled along East Campus Drive. Typically, project-generated noise level increases of 3 dBA or greater would be considered significant where exterior noise levels would exceed the normally acceptable noise level standard. Where noise levels would remain at or below the normally acceptable noise level standard with the project, noise level increases of 5 dBA or greater would be considered significant. As shown in **Table 7**, mobile noise generated by project trips would result in a maximum increase of 0.4 dBA L_{eq} along East Campus Drive compared to existing conditions. Vehicle trips would typically occur only during daytime hours and noise would not be generated continuously during the entire 24-hour period of a day. As the 24-hour CNEL noise level is calculated by averaging the 24 individual hourly noise levels (with sensitivity weighting applied for evening and nighttime hours) there is no potential for a non-continuous 0.4 dBA L_{eq} incremental increase in noise to result in a 3 dBA or more increase in CNEL. Therefore, the proposed project would result in a less-than-significant impact to sensitive receptors as related to mobile source noise.

[6] FTA, Transit Noise and Vibration Impact Assessment, September 2018.

TABLE 7: OFF-SITE MOBILE NOISE LEVELS ALONG EAST CAMPUS DRIVE				
Noise Monitoring Location/Receiver	**Existing Noise Level (dBA, L_{eq})**	**Project Noise Level (dBA, L_{eq})**	**New Ambient Noise Level (dBA, L_{eq})**	**Increase (dBA, L_{eq})**
ST-1	64.0	44.8	64.1	0.1
ST-2	62.2	52.0	62.6	0.4
ST-3	74.3	51.1	74.3	0.0

/a/ -4.5 dB for on intervening row of buildings and -1.5 dB for each subsequent row.
/b/ Mitigation Measures includes a 5 dB reduction from equipment mufflers and a 10 dB reduction for temporary noise barriers.
SOURCE: TAHA, 2022.

Operational noise related HVAC noise, parking activity, and off-site vehicle trips would not exceed their respective thresholds or the LBMC exterior noise standards. Impacts related to operational noise would be less than significant. Therefore, the proposed project's operational noise impacts would be similar to or less impactful than the less than significant with mitigation incorporated impact that was identified in the Campus Master Plan EIR. The proposed project would not result in any new or substantially increased environmental impacts beyond those disclosed in the Campus Plan EIR.

2008 EIR Mitigation Measures

Mitigation measures from the 2008 EIR would continue to be used for the proposed project.

N1 Muffled construction equipment will be used wherever possible.

N2 The contractor will ensure that each piece of operating equipment is in good working condition and that noise suppression features, such as engine mufflers and enclosures, are working and fitted properly.

N3 The contractor will locate noisy construction equipment as far as possible from residential areas.

N5 If a sustained high-noise construction activity takes place within 100 feet from classrooms or other noise-sensitive uses on campus, measures will be taken to limit the amount of noise affecting the sensitive receptor. These measures may include scheduling the activity when classes are not in session or the sensitive receptor is not use, providing a temporary barrier of no less than 6 feet in height made of wood or other similar materials; and/or other measures.

Project Specific Mitigation Measures

Additional project specific mitigation measures have been included to further reduce construction noise levels.

PN1 The construction contractor shall ensure that barriers, such as, but not limited to, plywood structures or flexible sound control curtains extending eight feet in height shall be erected along eastern perimeter of the Project site fronting the single-family residences to minimize the amount of noise during construction on the nearby noise-sensitive uses located offsite. Noise barriers shall be capable of reducing construction noise levels by at least 10 decibels.

b) Would the proposed project result in generation of excessive ground-borne vibration or ground-borne noise levels? (Less-than-Significant Impact)

Construction

Construction activity can generate varying degrees of vibration, depending on the procedure and equipment. Operation of construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of a construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, and to slight damage at the highest levels. In most cases, the primary concern regarding construction vibration relates to damage.

Typical equipment anticipated to be used during construction and their associated vibration levels are shown in **Table 7**. A large bulldozer would be representative of typical vibration generating construction equipment at the project site. A large bulldozer would generate a PPV of 0.089 inches per second at 25 feet, and a VdB of 87 micro-inches per second at 25 feet. The nearest sensitive receptors would be located approximately 100 feet away from construction activity. Vibration levels decreases rapidly with distance. At 100 feet, a large bulldozer would generate a PPV of 0.011 inches per second, and a VdB of 69 micro-inches per second. According to the FTA Transit Noise and Vibration Impact Assessment guidance, wood-framed buildings, such as the single-family residences to the east, reduce felt vibration by 5 VdB due to coupling to the building foundation. Therefore, the residences 100 feet away would receive a vibration level of approximately 64 VdB.[7] Vibration impacts at the nearest sensitive receptors would be below the 0.2 inches per second vibration damage criterion (PPV) and the 65 VdB threshold set forth in Section 8.80.200 (G) of the LBMC. Impacts related to on-site construction vibration would be less than significant. Therefore, the proposed project's on-site construction vibration impacts would be less impactful than the significant and unavoidable impact that was identified in the Campus Master Plan EIR. The proposed project would not result in any new or substantially increased environmental impacts beyond those disclosed in the Campus Plan EIR.

TABLE 7: VIBRATION LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	Vibration Level at 25 feet (Inches/Second)	Vibration Level at 25 feet (VdB)
Small Bulldozer	0.003	58
Excavator	0.040	80
Large Bulldozer	0.089	87
SOURCE: FTA, *Transit Noise and Vibration Impact Assessment*, September 2018.		

The project site is adjacent to the CSULB College of Liberal Arts, School of Art, and Peterson Hall 2. Having complete control of the proposed project, CSULB has the ability to adjust construction activities to avoid disrupting academic activities. If construction vibration were to disrupt activities at nearby classrooms, offices, laboratories, or other CSULB facilities, CSULB would work with the construction contractor to reduce vibration levels. The actions may include avoiding heavy-duty equipment use during academic activities and temporarily relocating affected uses.

[7] FTA, Transit Noise and Vibration Impact Assessment Guidance, Table 6-12: Path Adjustment Factors for Generalized Predictions of Groundborne Vibration and Noise, September 2018.

Operations

The proposed project would not include significant sources of vibration. Mechanical equipment and vehicle trips would not generate perceptible vibration beyond the project site. Therefore, the proposed project would result in a less-than-significant impact related to operational vibration. No mitigation measures would be necessary. The proposed project would not result in any new or substantially increased environmental impacts beyond those disclosed in the Campus Plan EIR.

Mitigation Measures

No mitigation measures are required.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the proposed project expose people residing or working in the project area to excessive noise levels? (No Impact)

The nearest airport, Long Beach Airport, is located more than two miles northwest of the project site. Additionally, the proposed project is located outside of the 60 dB CNEL contours of the Long Beach Airport and is not affected by aircraft noise.[8] Therefore, no impact related to airport or airstrip noise would occur. The proposed project would not result in any new or substantially increased environmental impacts beyond those disclosed in the Campus Plan EIR.

Mitigation Measures

No mitigation measures are required.

References

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City of Long Beach Municipal Code, *Section 8.80.150 Exterior Noise Limits—Sound Levels by Receiving Land Use District.*

City of Long Beach Municipal Code, *Section 8.80.160 Exterior Noise Limits – Correction for Character of Sound*.

City of Long Beach Municipal Code, *Section 8.80.200 Noise Disturbances—Acts Specified.*

[8]Long Beach Airport, *Year 2004 CNEL Contours*, available at http://www.longbeach.gov/globalassets/lgb/community-information/noise-abatement/eir-noise-contour, 2005.

City of Long Beach Municipal Code, *Section 8.80.202 Construction Activity—Noise Regulations.*

City of Long Beach Municipal Code, *Section 8.80.340 Variance—Exemption from regulations.*

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Noise Levels of Lift Trucks, 25 May 2001, rigolett.home.xs4all.nl/ENGELS/equipment/liftfr.htm.

Appendix

<u>Noise and Vibration Calculations</u>

Noise Formulas

Noise Distance Attenuation

Hard Site
Ni = No - 20 * LOG(Di/Do)

Di = distance to receptor (Di>Do)

Ni = attenuated noise level of interest
No = reference noise level

Do = reference distance

Source: (Bolt, Beranek, and Newman, 1971)

Summation of Noise Levels

Equation: Ns=10 x LOG10((10^(N1/10))+(10^(N2/10))+(10^(N3/10))+(10^(N4/10)))

Ns = Noise Level Sum
N1 = Noise Level 1
N2 = Noise Level 2
N3 = Noise Level 3
N4 = Noise Level 4

Source: California Department of Transportation, Technical Noise Supplement, 2013

Phased Construction Noise Levels	
Construction Equipment	**Noise Level at 50 feet (dBA)**
Demolition	
Concrete Saw	82.6
Tractor	80.0
Dozer	77.7
Front End Loader	75.1
Backhoe	73.6
Combined Demolition Noise	**84.5**
Site Preparation	
Grader	81.0
Dozer	77.7
Backhoe	73.6
Combined Site Preparation Noise	**82.7**
Grading	
Grader	81.0
Dozer	77.7
Backhoe	73.6
Combined Grading Noise	**82.7**
Trenching	
Trencher	77.3
Excavator	76.7
Front End Loader	75.1
Backhoe	73.6
Combined Trenching Noise	**80.0**
Building Construction	
Generator	77.6
Backhoe	73.6
Crane	72.6
Welder	70.0
Forklift	63.2
Combined Building Construction Noise	**79.1**
Paving	
Cement and Mortar Mixers	77.0
Paver	74.2
Backhoe	73.6
Roller	73.0
Combined Paving Noise	**78.8**
Architectural Coating	
Air Compressor	73.7
Combined Architectural Coating Noise	**73.7**

Source: Federal Highway Administration, Roadway Construction Noise Model, 2008
Source: *Noise Levels of Lift Trucks* , 25 May 2001, rigolett.home.xs4all.nl/ENGELS/equipment/liftfr.htm.

Existing Ambient Noise Levels	
[Noise Measurement Site] Noise Monitoring Locations	**Sound Level (dBA, Leq)**
(ST-1) Hardfact Hill along East Campus Drive	64
(ST-2) E7 Parking Lot adjacent to Peterson Hall 1, along East Campus Drive	62.2
(ST-3) E8 Parking Lot along East Campus Drive	74.3

City of Long Beach Adjusted Exterior Noise Standards			
Sensitive Receptors Near…	**Original Threshold for Noise District One (dBA, Leq)**	**Monitored Noise Levels (dBA, L50)**	**Adjusted Standard for Noise District One (dBA, L50)**
(ST-1) Hardfact Hill along East Campus Drive	50	54.9	55
(ST-2) E7 Parking Lot adjacent to Peterson Hall 1, along East Campus Drive	50	54.7	55
(ST-3) E8 Parking Lot along East Campus Drive	50	58	60

Adjust Noise Level

Sensitive Receptors	Distance (feet)	Existing Noise Level
Residences along Hillside Dr. to the east	100	63.1
Residences along Hillside Dr. to the east	200	63.1
Residences along Hillside Dr. to the east	300	63.1
Residences along Hillside Dr. to the east	400	63.1
Residences along Hillside Dr. to the east	280	54.2
Residences along E. Vera Crest Dr. to the e	415	50.7

CONSTRUCTION NOISE LEVELS AT SENSITIVE RECEPTORS							
Sensitive Receptors	**Distance (feet)**	**Intervening Building /a/**	**Reference Noise Level (dBA)**	**Max Construction Noise Level (dBA, Leq)**	**Existing Noise Level**	**Construction 5 dBA Increase over Existing?**	**Noise Level Difference (dBA, Leq)**
Residences along Hillside Dr. to the east	100	0	84.5	78.5	63.1	Yes	15.4
Residences along Hillside Dr. to the east	200	0	84.5	72.5	63.1	Yes	9.4
Residences along Hillside Dr. to the east	280	4.5	84.5	65.0	54.1	Yes	10.9
Residences along Hillside Dr. to the east	300	0	84.5	68.9	63.1	Yes	5.8
Residences along Hillside Dr. to the east	400	0	84.5	66.4	63.1	No	3.3
Residences along E. Vera Crest Dr. to the east	415	6	84.5	60.1	50.7	Yes	9.4

/a/ -4.5 dB for on intervening row of buildings and -1.5 dB for each subsequent row

MITIGATED CONSTRUCTION NOISE LEVELS AT SENSITIVE RECEPTORS										
Sensitive Receptors	**Distance (feet)**	**Intervening Building /a/**	**Reference Noise Level (dBA)**	**Mitigation Measure /b/**	**Mitigation /b/**	**Mitigated Noise Level**	**Max Construction Noise Level (dBA, Leq)**	**Existing Noise Level**	**Construction 5 dBA Increase over Existing?**	**Noise Level Difference (dBA, Leq)**
Residences along Hillside Dr. to the east	100	0	84.5	N1, PN1	15.0	69.5	63.5	63.1	No	0.4
Residences along Hillside Dr. to the east	200	0	84.5	N1, PN1	15.0	69.5	57.5	63.1	No	-5.6
Residences along Hillside Dr. to the east	280	4.5	84.5	N1, PN1	15.0	69.5	50.0	54.1	No	-4.1
Residences along Hillside Dr. to the east	300	0	84.5	N1, PN1	15.0	69.5	53.9	63.1	No	-9.2
Residences along Hillside Dr. to the east	400	0	84.5	N1, PN1	15.0	69.5	51.4	63.1	No	-11.7
Residences along E. Vera Crest Dr. to the east	415	6	84.5	N1, PN1	15.0	69.5	45.1	50.7	No	-5.6

/a/ -4.5 dB for on intervening row of buildings and -1.5 dB for each subsequent row
/b/ Mitigation Measures N1 Includes a 5 dB reduction for equipment mufflers.

HVAC EQUIPMENT NOISE LEVEL						
Sensitive Receptors	**Distance (feet)**	**Project Site Height to Roof**	**Diagonal Distance form Project Site to Sensitive Receptor**	**Intervening Building /a/**	**Reference Noise Level (dBA)**	**HVAC Equipment Noise Level (dBA, Leq)**
Residences along Hillside Dr. to the east	200	45	205	0	50	37.7

Source: Daikin Air Intelligence, Base Efficient Air Conditioner Packaged Rooftop Unit DBC Commercial 7.5 – 12.5 Nominal Tons, available at https://budgetheating.com/v/vspfiles/downloadables/DBC%20Series%207.5-12.5%20Tons%20Technical%20Specifications.pdf.

PARKING ACTIVITY NOISE ANALYSIS	
Parking Lot Noise = Reference Noise Level + 10 x LOG (Number of Average Peak Hour Trips/1000)	
Reference Noise Level at 50 feet (dBA, Leq)	**Reference Parking Lot Capacity (parking spaces)**
56.4	1,000
Proposed Project Parking Noise Level at 50 feet (dBA, Leq)	**Maximum Trips**
42.9	45
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment* , September 2018	

PARKING ACTIVITY NOISE LEVEL				
Sensitive Receptors	**Distance (feet)**	**Intervening Building /a/**	**Reference Noise Level (dBA)**	**Parking Activity Noise Level (dBA, Leq)**
Residences along Hillside Dr. to the east	100	0	42.9	36.9

OFF-SITE MOBILE NOISE LEVEL ALONG EAST CAMPUS DRIVE				
Noise Monitoring Location/Receiver	**Existing Noise Level (dBA, L_{eq})**	**Project Noise Level (dBA, L_{eq})**	**New Ambient Noise Level (dBA, L_{eq})**	**Increase (dBA, L_{eq})**
ST-1	64	44.8	64.1	0.1
ST-2	62.2	52	62.6	0.4
ST-3	74.3	51.1	74.3	0.0

Vibration Formulas

Vibration PPV Attenuation

Equation: PPVequip = PPVref x (25/D)^1.5
PPV (equip) is the peak particle velocity in in/sec of the equipment adjusted for distance
PPV (ref) is the reference vibration level in in/sec at 25 feet from Table 12-2
D is the distance from the equipment to the receiver.

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018.

Vibration VdB Attenuation

Equation: Lv(D) = Lv(25 ft) – 30log(D/25)
D = Distance (feet)
Lv(D) = Vibration Level

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018.

Vibration Velocities for Construction Equipment		
Equipment	Peak Particle Velocity (PPV) at 25 feet (Inches/Second)	Vibration Velocity (VdB) at 25 feet (Micro-Inches/Second)
Small Bulldozer	0.003	58
Excavator	0.040	80
Large Bulldozer	0.089	87

SOURCE: NHDOT, Ground Vibrations Emanating from Construction Equipment, September 2012.
SOURCE: FTA, Transit Noise and Vibration Impact Assessment, September 2018.

Vibration Assessment (Large Bulldozer)				
Sensitive Receptor	Distance (feet)	PPV at Structure	VDB at Structure	VDB with Building Coupling Reduction /a/
Residences along Hillside Dr. to the east	100	0.0111	69	64
Residences along Hillside Dr. to the east	200	0.0039	60	55
Residences along Hillside Dr. to the east	300	0.0021	55	50
Residences along Hillside Dr. to the east	400	0.0014	51	46
Residences along Hillside Dr. to the east	280	0.0024	56	51
Residences along E. Vera Crest Dr. to the east	415	0.0013	50	45

/a/ FTA Transit Noise and Vibration Impact Assessment guidance allows a -5 VdB reduction for wood framed buidlings

Traffic Noise Model Results

REPORT: **Results: Sound Levels - No Barrier Objects**

TNM VERSION	3.1.7970.37608	REPORT DATE:	19 April 2022
CALCULATED WITH:	3.1.7970.37608	CALCULATION DATE:	4/19/2022 5:28:31 PM
CASE:	CSLUB Peterson Hall	ORGANIZATION:	Terry A. Hayes Associates Inc.
UNITS:	English	ANALYSIS BY:	Kieran Bartholow
DEFAULT GROUND TYPE:	Pavement	PROJECT/CONTRACT	
ATMOSPHERICS:	68°F, 50%		
PAVEMENT TYPE(S) USED:	Average		

Average pavement type shall be used unless a state highway agency substantiates the use of a different type with approval FHWA.

Receiver				Modeled Traffic Noise Levels				
				LAeq		Increase over Existing		
Name	No.	Nb. R.R.	Existing LAeq	Calc.	Absolute Criterion	Calc.	Relative Criterion	Type of Impact
			dBA	dBA	dBA	dBA	dBA	
ST-3	1	1	---	51.1	0.0	---	---	Sound Level
ST-2	2	1	---	52.0	0.0	---	---	Sound Level
ST-1	3	1	---	44.8	0.0	---	---	Sound Level

Noise Monitoring Data

Noise Monitoring Location ST-1 (Hardfact Hill along East Campus Dr.)

Session Report

12/10/2021

Information Panel

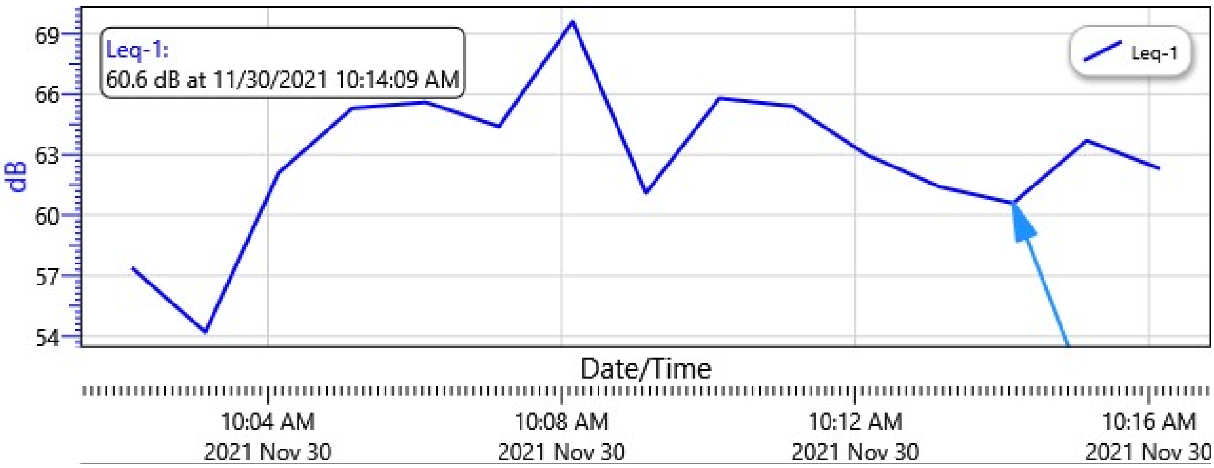
Name	CSLUB Peterson Hall_ST-1
Start Time	11/30/2021 10:01:09 AM
Stop Time	11/30/2021 10:16:09 AM
Device Name	BGS100001
Model Type	SoundPro DL
Device Firmware Rev	R.13H
Comments	
Run Time	00:15:00

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Lmax	1	81.7 dB	Lmin	1	48.4 dB
Leq	1	64 dB	L50	1	54.9 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	SLOW			

Logged Data Chart

S272: Logged Data Chart



Logged Data Table

Date/Time	Leq-1
11/30/2021 10:02:09 AM	57.4
10:03:09 AM	54.2
10:04:09 AM	62.1
10:05:09 AM	65.3
10:06:09 AM	65.6
10:07:09 AM	64.4
10:08:09 AM	69.6
10:09:09 AM	61.1
10:10:09 AM	65.8
10:11:09 AM	65.4
10:12:09 AM	63
10:13:09 AM	61.4
10:14:09 AM	60.6
10:15:09 AM	63.7
10:16:09 AM	62.3

Noise Measurement Report Form

Project: CSULB Peterson Hall 1 Contract No (s): N/A

Date: 11/30/21 Day of Week: Tuesday Time: 10:00 AM

Monitoring Site Number: ST-1 Monitoring Site Address: Hardfact Hill

Measurement Taken By: Billy

Approximate Wind Speed: 1 mph [km/hr] Approximate Wind Direction: From the SW

Approximate distance of Sound Level Meter from Receptor Location:

Approximate distance of Sound Level Meter from Project Site: 590ft.

Receptor Land Use (Check One) ☑ Residential / Institutional ☐ Commercial / Recreational

Sound Level Meter: Make and Model: Serial Number:

Meter Setting ☑ A-Weighted Sound Level (SLOW) ☐ C-Weighted Sound Level (FAST) for Impacts

Duration of Measurement: 15m

Check the measurement purpose:

☑ Baseline condition ☐ Ongoing construction ☐ Major change ☐ Complaint response

Measurement Results:

Measurement Type	Measured Level	Noise Criteria Threshold	Exceedance
Calibration	114 dba	n/a	n/a
L_{eq}	64.1 dba		
L_{max}			
L_{dn}			
CNEL			

Field Notes:

1. Noise monitor located across the edge of the last house on Hillside Dr.
2. flight route.
3.
4. S272

Noise Monitoring Location ST-2 (E7 Parking Lot adjacent to Peterson Hall 1, along East Campus Dr.)

Session Report

12/10/2021

Information Panel

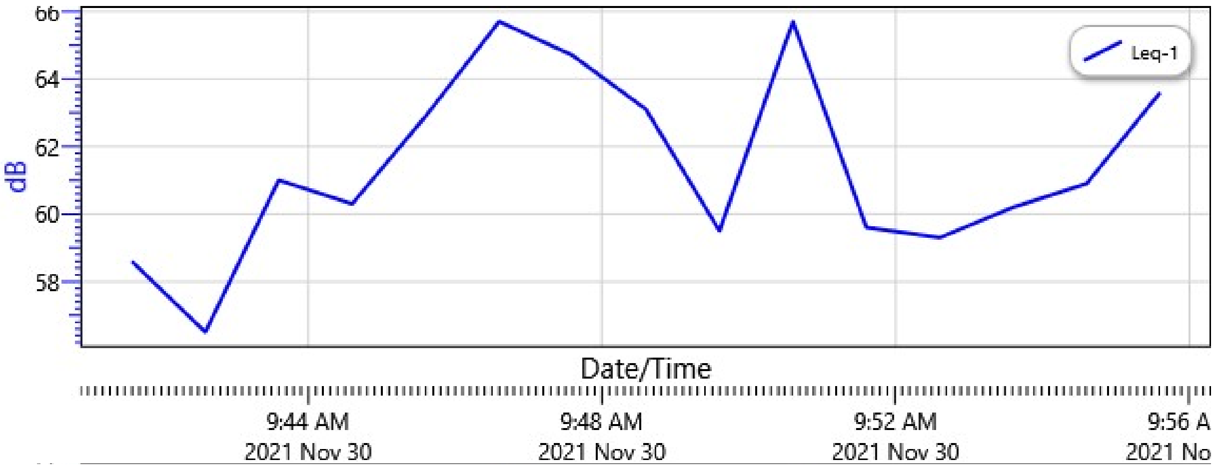
Name	CSLUB Peterson Hall_ST-2
Start Time	11/30/2021 9:40:36 AM
Stop Time	11/30/2021 9:55:36 AM
Device Name	BGS100001
Model Type	SoundPro DL
Device Firmware Rev	R.13H
Comments	
Run Time	00:15:00

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	62.2 dB	Lmax	1	75.9 dB
Lmin	1	48.2 dB	L50	1	54.7 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	SLOW			

Logged Data Chart

S271: Logged Data Chart



Logged Data Table

Date/Time	Leq-1
11/30/2021 9:41:36 AM	58.6
9:42:36 AM	56.5
9:43:36 AM	61
9:44:36 AM	60.3
9:45:36 AM	62.9
9:46:36 AM	65.7
9:47:36 AM	64.7
9:48:36 AM	63.1
9:49:36 AM	59.5
9:50:36 AM	65.7
9:51:36 AM	59.6
9:52:36 AM	59.3
9:53:36 AM	60.2
9:54:36 AM	60.9
9:55:36 AM	63.6

Noise Measurement Report Form

Project: CSULB Peterson Hall 1 Contract No (s): N/A

Date: 11/30/21 Day of Week: Tuesday Time: 9:40 AM

Monitoring Site Number: ST-2 Monitoring Site Address: E7 Parking Lot

Measurement Taken By: Billy

Approximate Wind Speed: 1 mph [km/hr] Approximate Wind Direction: From the SW

Approximate distance of Sound Level Meter from Receptor Location:

Approximate distance of Sound Level Meter from Project Site: 160ft.

Receptor Land Use (Check One) ☑ Residential / Institutional ☐ Commercial / Recreational

Sound Level Meter: Make and Model: Serial Number:

Meter Setting ☑ A-Weighted Sound Level (SLOW) ☐ C-Weighted Sound Level (FAST) for Impacts

Duration of Measurement: 15m.

Check the measurement purpose:

☑ Baseline condition ☐ Ongoing construction ☐ Major change ☐ Complaint response

Measurement Results:

Measurement Type	Measured Level	Noise Criteria Threshold	Exceedance
Calibration	114 dba	n/a	n/a
L_{eq}	62.2 dba		
L_{max}			
L_{dn}			
CNEL			

Field Notes:

1. Intermittent sawing noise near Fine Arts building.
2. Flight route
3. pathway seems to be commonly used.
4. S271

Noise Monitoring Location ST-3 (E8 Parking Lot along East Campus Dr.

Session Report

12/10/2021

Information Panel

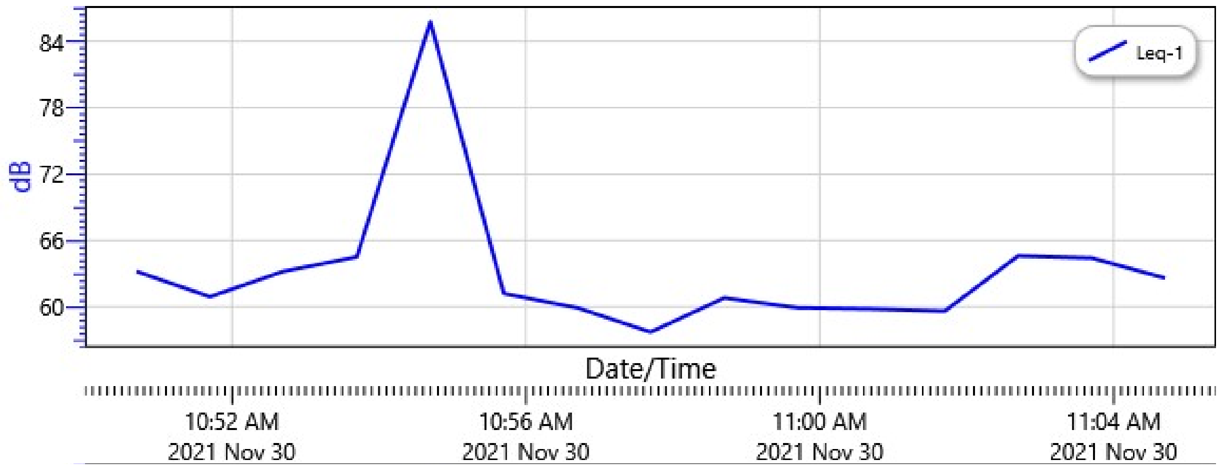
Name	CSLUB Peterson Hall_ST-3
Start Time	11/30/2021 10:49:42 AM
Stop Time	11/30/2021 11:04:42 AM
Device Name	BGS100001
Model Type	SoundPro DL
Device Firmware Rev	R.13H
Comments	
Run Time	00:15:00

Summary Data Panel

Description	Meter	Value	Description	Meter	Value
Leq	1	74.2 dB	Lmax	1	99.7 dB
Lmin	1	49.7 dB	L50	1	58 dB
Exchange Rate	1	3 dB	Weighting	1	A
Response	1	SLOW	Bandwidth	1	OFF
Exchange Rate	2	3 dB	Weighting	2	A
Response	2	SLOW			

Logged Data Chart

S273: Logged Data Chart



Logged Data Table

Date/Time	Leq-1
11/30/2021 10:50:42 AM	63.2
10:51:42 AM	60.9
10:52:42 AM	63.2
10:53:42 AM	64.5
10:54:42 AM	85.8
10:55:42 AM	61.2
10:56:42 AM	59.9
10:57:42 AM	57.7
10:58:42 AM	60.8
10:59:42 AM	59.9
11:00:42 AM	59.8
11:01:42 AM	59.6
11:02:42 AM	64.6
11:03:42 AM	64.4
11:04:42 AM	62.6

Noise Measurement Report Form

Project: CSULB Peterson Hall 1 Contract No (s): N/A

Date: 11/30/21 Day of Week: Tuesday Time: 10:50AM

Monitoring Site Number: ST-3 Monitoring Site Address: E8 Parking Lot

Measurement Taken By: Billy

Approximate Wind Speed: 1 mph [km/hr] Approximate Wind Direction: From the SW

Approximate distance of Sound Level Meter from Receptor Location:

Approximate distance of Sound Level Meter from Project Site: 680ft.

Receptor Land Use (Check One) ☑ Residential / Institutional ☐ Commercial / Recreational

Sound Level Meter: Make and Model: Serial Number:

Meter Setting ☑ A-Weighted Sound Level (SLOW) ☐ C-Weighted Sound Level (FAST) for Impacts

Duration of Measurement: 15m

Check the measurement purpose:

☑ Baseline condition ☐ Ongoing construction ☐ Major change ☐ Complaint response

Measurement Results:

Measurement Type	Measured Level	Noise Criteria Threshold	Exceedance
Calibration	114 dba	n/a	n/a
L_{eq}	74.3 dba		
L_{max}			
L_{dn}			
CNEL			

Field Notes:

1. · Audible traffic noise from E 7th Street.
· E 7th St. below elevation of ST-3.
2. · E8 parking lot sounds include cars, motorcycles, and buses.
3. · motorcycles creating louder noise than cars and buses
4. · flight note
· traffic busier here than on ST-1 & ST-2.

S273

APPENDIX F

Vehicle Miles Traveled Assessment

AECOM

Technical Memorandum

To: Melissa Soto, Program Planner, California State University, Long Beach

From: Nak H. Kim, P.E., AECOM

Date: April 21, 2022

Re: The California State University, Long Beach - Peterson Hall 1 Replacement Building Project - Vehicle Miles Traveled Assessment

---

The purpose of this memorandum is to document the results of the Vehicle Miles Traveled (VMT) Assessment conducted for the proposed Peterson Hall 1 (PH1) Replacement Building Project (proposed project) on the California State University, Long Beach (CSULB) campus. This memo provides an estimation of construction and operational trip generation by the proposed project in order to determine if a formal traffic study is warranted.

1.0 PROJECT LOCATION

The project site is located on the CSULB campus, which is in the eastern part of the City of Long Beach, California. The City of Long Beach is surrounded by the cities of Paramount and Lakewood to the north; the Pacific Ocean to the south; the cities of Hawaiian Gardens, Cypress, Los Alamitos, and Seal Beach, as well as the unincorporated Orange County community of Rossmoor, to the east; and the cities of Los Angeles, Carson, and Compton to the west. Figure 1 illustrates the project location map, and Figure 2 presents an aerial view of the project site and its general vicinity.

2.0 PROJECT DESCRIPTION

2.1 Project Objectives

The proposed project is intended to support educational excellence by providing adequate facilities to support the growing demand for innovative instructional and research space and adaptable student resources. The underlying purpose of the proposed project is to achieve this by consolidating the College of Health and Human Services (CHHS), which is currently dispersed across the campus in eight buildings, into a single new three-story building that includes a public teaching clinic operated with a clinical partner to improve efficiency and allow for effective collaboration and sharing of college resources.

AECOM

Figure 1. Project Location Map

Source: Esri, 2021.

0 1,500 3,000 Feet

CSULB Boundary
Project Site
County Boundary

AECOM

Figure 2. Aerial View of Project Site and its Immediate Vicinity

2.2 Project Summary

The proposed project would construct a new 137,072 gross-square-foot (GSF), three-story building for the CHHS to replace the existing PH1 building and the Faculty Office 4 (FO4) and Faculty Office 5 (FO5) temporary office buildings. The replacement facility would occupy the current PH1 and FO5 building footprints. FO4 would become future additional surface parking. The replacement building would include faculty space, student collaboration space, teaching labs, research labs, administration space, and a clinic to be operated in cooperation with a local clinical partner. The clinic would be based on a "teaching-clinic model" and would be located on the first floor of the replacement building.

This section provides an overview of various elements to be performed to implement the project features.

2.2.1 Construction Equipment

Equipment required for construction of the proposed project includes a saw, a dozer, tractors, loaders, concrete trucks, delivery trucks, dump trucks, boom trucks, backhoes, graders, an excavator, trenchers, a crane, a forklift, a generator set, welders, a cement and mortar mixer, a paver, paving equipment, a roller, and an air compressor. The construction equipment would be in use from 6 to 8 hours per day.

2.2.2 Construction Trip Generation Estimates

Table 1 summarizes haul truck trips, construction worker trips, and vendor/delivery trips.

Table 1. Construction Trip Assumptions

Phase	Duration (Days)	Export Quantity	Approx. Haul Loads (15 CY/Load)	Max Daily Haul Trucks	Daily Worker Vehicles	Max Daily Vendor Deliveries
Demo	45	1,060 Tons	85	(5 round trips) x (2 one-way trips) = (10 one-way trips)	50	-
Site Prep	45	-	-	-	50	-
Grading	45	4,000 CY	270	(10 round trips) x (2 one-way trips) = (20 one-way trips	50	-
Trenching/Utilities	45	-	-	-	50	-
Building Con.	280	-	-	-	100	26
Paving	35	-	-	-	50	15
Finishing/Landscaping	45	-	-	-	50	4

Approximately 50 construction workers are anticipated to be on-site daily on a regular basis, with a peak of approximately 100 construction workers during construction of the replacement building.

The number of construction trips, including workers, vendors and deliveries, and haul trucks, would vary depending on the construction phase. The most intensive construction activity would take place during the building construction phase and would result in 200 worker round trips and 52 vendor truck round trips. The maximum daily haul truck trip activity would occur during the 45-

day grading phase and would generate approximately 20 daily haul truck round trips. Approximately 4,000 cubic yards of excavated soil and 1,060 tons of demolition debris would be hauled during the 45 days of grading and demolition phases, respectively. Assuming the proposed project would utilize a 15-cubic yard haul truck, approximately 355 haul loads would generate 710 round trips in total.

2.2.3 Hours of Construction

The majority of construction activities are anticipated to occur during daytime hours, generally from 7:00 a.m. to 5:00 p.m., Monday through Friday. However, it is anticipated that some nighttime hours and weekends may be required in order to maintain the construction schedule and minimize road detours. All construction activities would comply with Section 8.80.202 of the Long Beach Municipal Code regarding construction noise.

2.2.4 Schedule of Construction

The anticipated construction schedule for the project is from March 2024 to March 2026. For environmental analysis purposes, it is assumed construction would be completed in approximately 24 months. Construction activities at the proposed project site would include mobilization and staging; building demolition; site clearing, grading, and paving; new structure construction; equipment installation; and landscaping and finishing.

2.2.5 Demolition and Construction Debris/Soil Disposal Phase

Approximately 4,000 cubic yards of excavated soil and 1,060 tons of demolition debris would be hauled to Puente Hills Materials Recovery Facility, located at 2808 Workman Mill Road in Whittier, California (approximately 21.6 miles from the project site). This recovery facility has the available landfill capacity to process 4,400 tons of waste per day. It is anticipated that Puente Hills Materials Recovery Facility would be utilized for the disposal of demolition debris, construction spoils, and construction waste after the implementation of required recycling of these materials.

2.2.6 Facility Operation and Maintenance

The proposed project includes a 15,000-GSF clinic operated by a clinical partner in collaboration with the CSULB CHHS to deliver public clinical care and support clinical education. Operation and maintenance of the facility would be conducted by the California State University with the clinical partner on an ongoing basis. Figure 3 illustrates the project site plan.

2.2.7 Operational Trip Generation Estimates

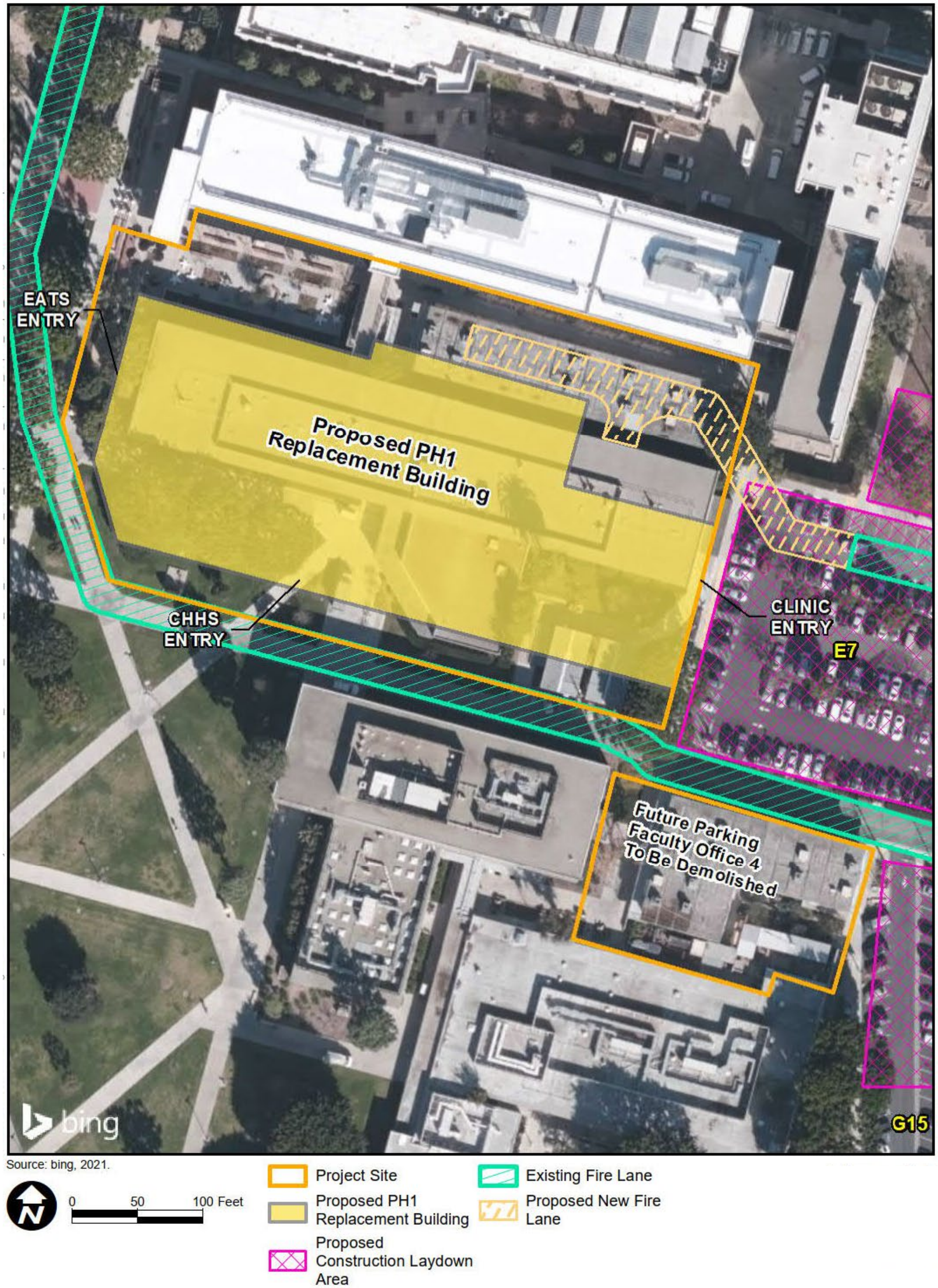
Trip Generation, 11th Edition (Institute of Transportation Engineers [ITE], 2022) was used to estimate trips generated by the proposed project. This publication represents the industry standard for estimating trip generation and is based on a compilation of empirical trip generation surveys at locations throughout the country.

The land use identified in the Trip Generation, 11th Edition (ITE, 2022) for estimating trips generated by the proposed project is Medical Clinic (ITE land use: 630).

Trip generation estimates are based on the proposed project's medical clinic space square footage of. Trip generation estimates are presented on a daily basis (see Appendix A), for the morning peak hour (see Appendix B), and evening peak hour on a typical weekday (see Appendix C).

The proposed project's new trip generation is an estimated 564 daily trips, including 52 morning peak hour trips and 63 evening peak hour trips. The clinic represents the only new use for the proposed project and thus the overall trip generation includes trips from the clinic staff, clinic patients, and CSULB students and CSULB employees related to the clinic. It should be noted that the consolidation of the existing CHHS dispersed throughout the campus in eight buildings into a single academic building would not change the current VMT as far as students/faculty/staff are concerned.

Figure 3. Project Site Plan



3.0 VMT ASSESSMENT

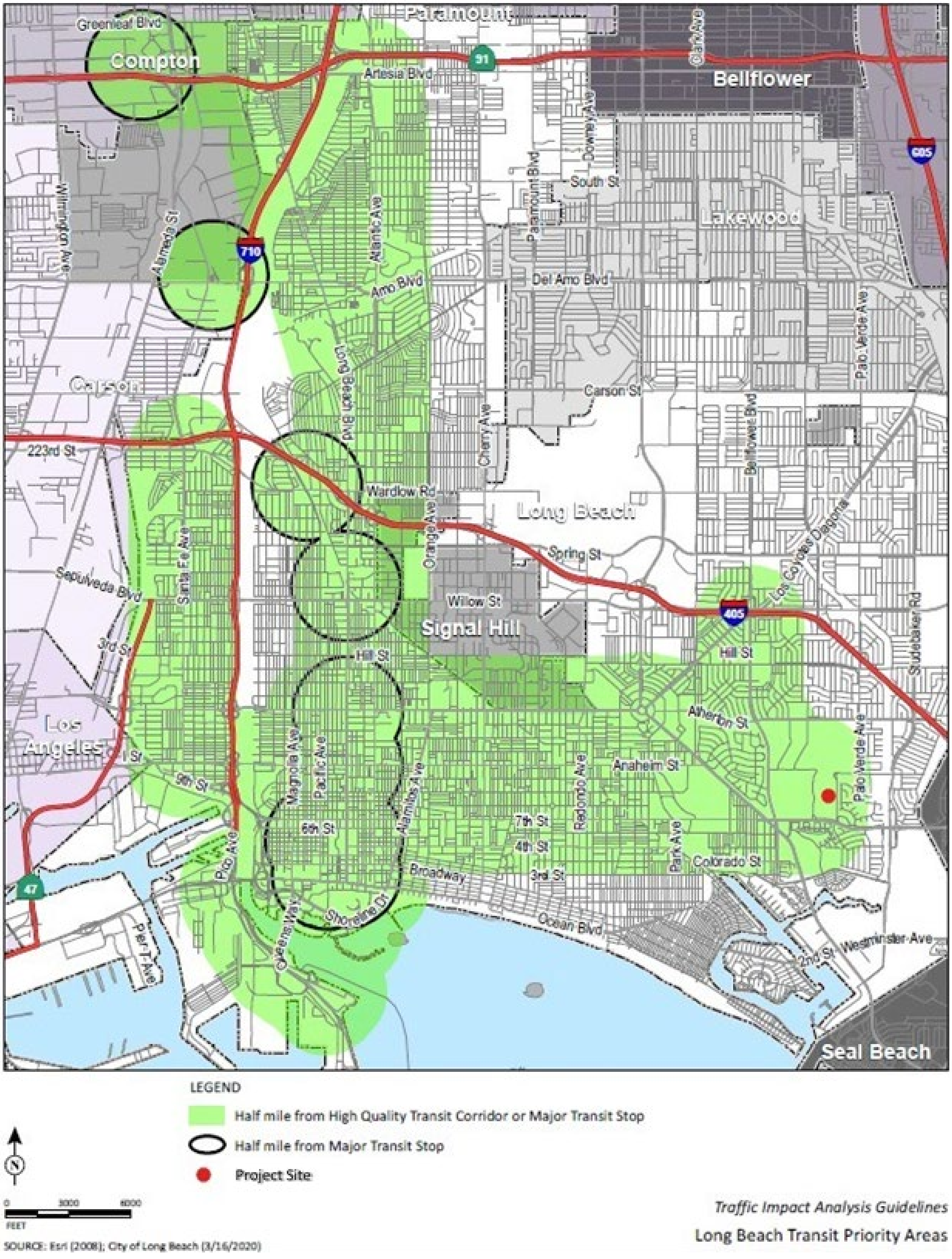
The VMT assessment for the proposed project was prepared following the *California State University Transportation Impact Study Manual* prepared by Fehr & Peers (Fehr & Peers, 2019). According to the *California State University Transportation Impact Study Manual*, the following types of projects can be screened from project-level assessment on the basis of certain characteristics (e.g., location) because it can be assumed such project types would not result in significant VMT impacts. These project types and screening attributes, which are noted below, have the potential to decrease the number of trips and/or the trip length around their development, further decreasing VMT.

- Development in Transit Priority Areas (TPA[1]);
- Development in a low-VMT generating area of the city, sub-region, or region; or
- On-campus housing serving students, faculty, and staff.

FO4 would be demolished and replaced with a surface parking lot that would provide approximately 45 new dedicated parking spaces for the clinic, which would be available for use by the campus outside of clinic hours. The proposed project does not include substantially more parking than required, such that it discourages transit use by making it too convenient to drive. The proposed project is located in the Long Beach TPA. Figure 4 presents the TPA for the city of Long Beach. The TPAs are defined as development located within a one-half mile of either an existing major transit stop or a stop along an existing high-quality transit corridor. As shown in Figure 4, the project site is located where the access to transit is within a one-half mile walking distance, and the proposed project would not negatively impact transit, bike or pedestrian infrastructure. In addition, according to CEQA Guidelines Section 15064.3(b)(1), "Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact." Therefore, the proposed project can be screened from project-level VMT assessment and is presumed not to result in significant VMT impacts.

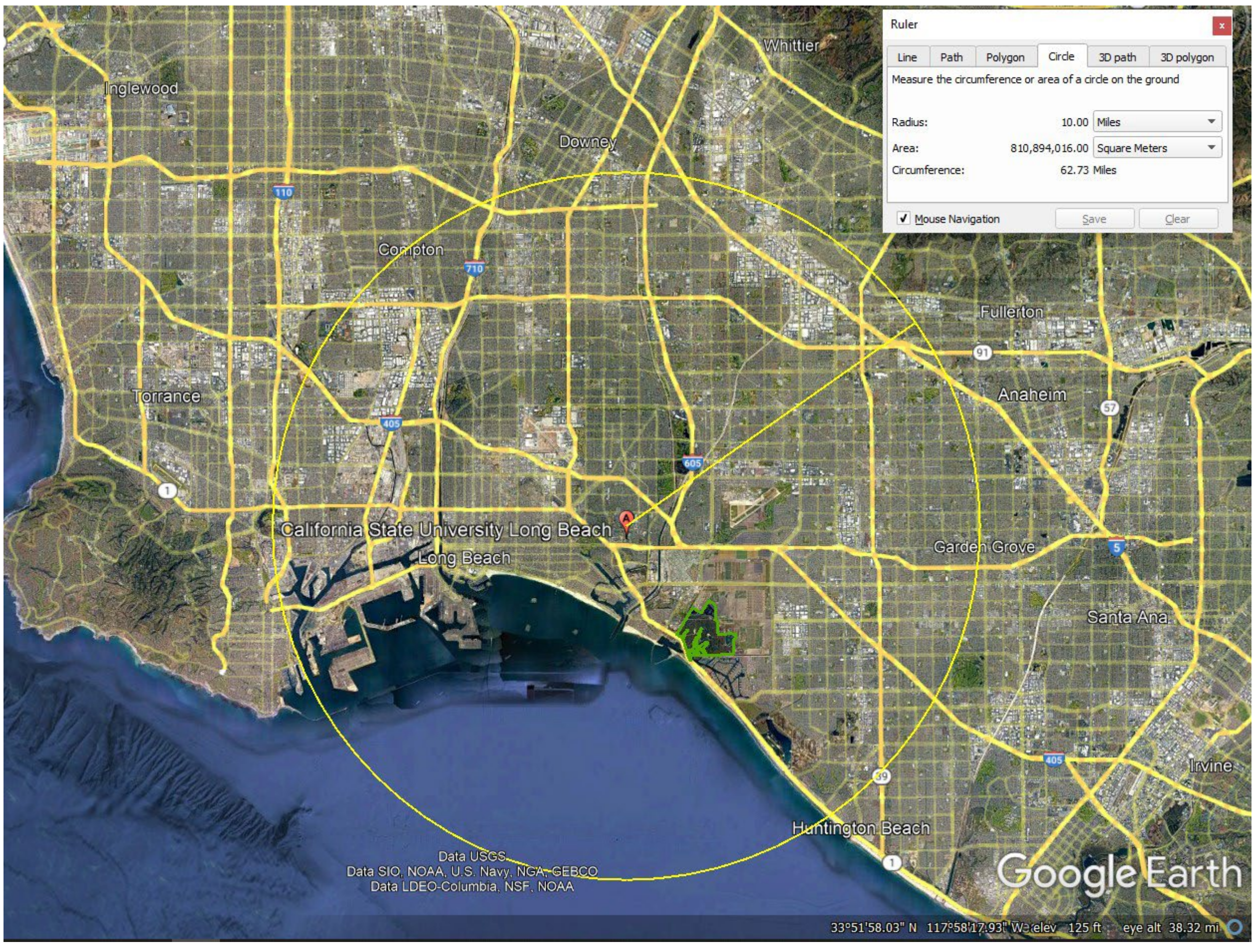
[1] TPAs are defined as development located within a one-half mile of either an existing major transit stop (defined as a rail transit stop, ferry terminal serviced by either bus or rail transit, or the intersection of two or more major bus routes with 15-minute or better headways during the peak commute periods) or a stop along an existing high quality transit corridor (defined as a fixed route bus service with headways of 15-minutes or better) (Fehr & Peers, 2019).

Figure 4. Long Beach Transit Priority Areas



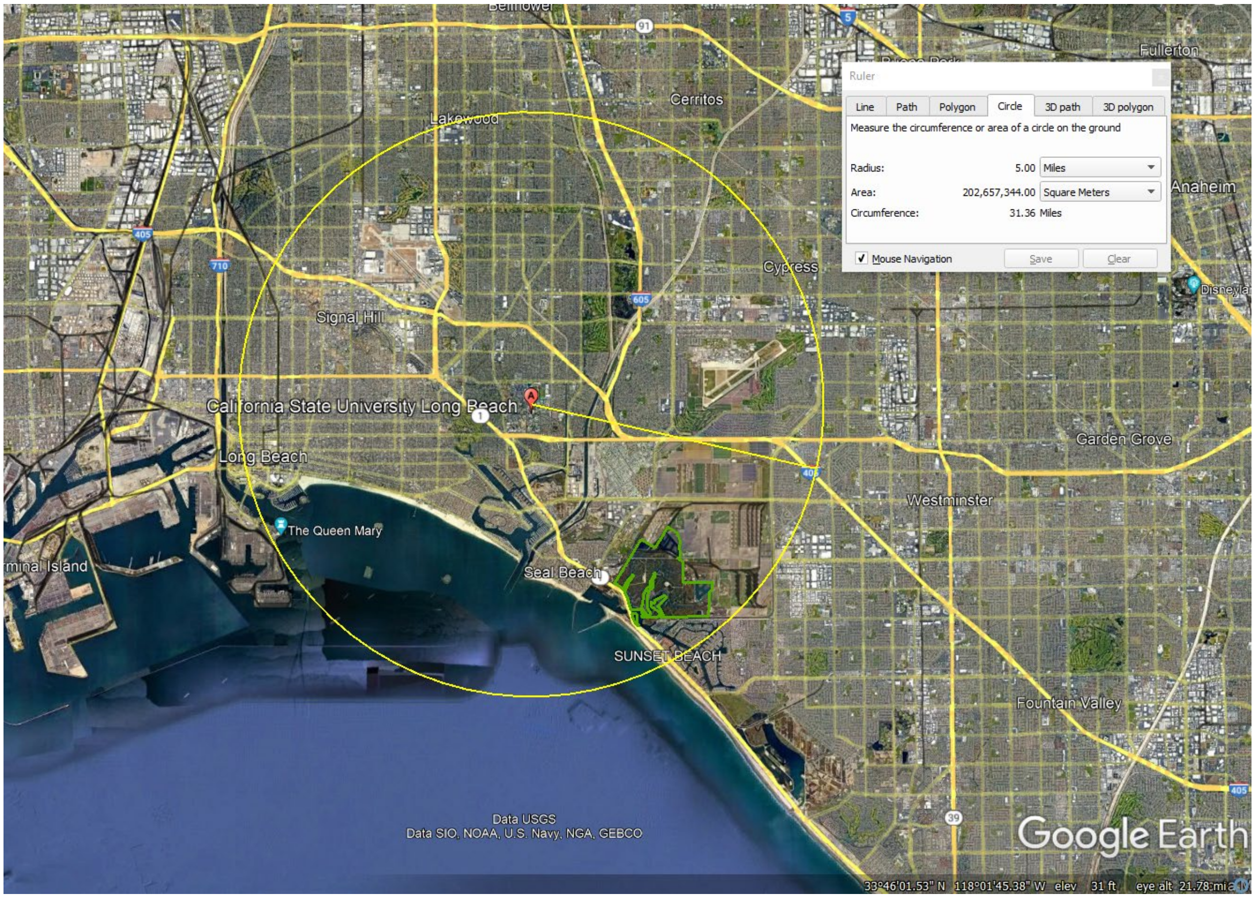
Nationwide, the average distance traveled for medical/dental care was 10.2 miles; rural trips averaged 17.5 miles versus 8.3 miles for urban residents (Probst et al., 2006). Therefore, the anticipated clinic service area is estimated to be approximately 10 miles. Cities/sub-regional areas where clinic patients are expected to come from include Long Beach; Carson; Los Angeles; Compton; Paramount; Bellflower; Lakewood; Signal Hill; Norwalk; Cerritos; Artesia; Hawaiian Gardens; Buena Park; La Palma; Cypress; Los Alamitos; Seal Beach; Anaheim; Stanton; Garden Grove; Westminster; and Huntington Beach. Figure 5 illustrates the 10-mile-radiusservice area.

Figure 5. 10 miles-Radius of Service Area



In addition, according to the information obtained from the clinic partner, the majority of the clinic patients will come from within 5 miles of the clinic, based on how the clinic partner distributes their clinics. Cities located within a 5-mile-radius include Long Beach, Signal Hill, Lakewood and Cypress. Figure 6 illustrates the 5-mile-radius service area.

Figure 6. 5 miles-Radius of Service Area



4.0 CONCLUSION

The proposed project involves construction of a three-story building for the CHHS to replace the existing PH1 building and the FO4 and FO5 temporary office buildings. During the construction phase, construction traffic could contribute to roadway hazards because of the large volume of trucks and construction activity moving in and out of the streets and the haul routes along State Route 22 and Interstate 605. However, the traffic increases during the construction phase would be transitory and temporary, and a vehicular and pedestrian traffic management plan would be developed and approved prior to the start of construction. Because the traffic management plan would incrementally reduce peak hour trips through avoidance of peak hours to the extent feasible and by consolidating trips, impacts to the circulation system would be less than significant. In addition, construction activities associated with the proposed project would occur mainly within the project site during the construction period and temporary partial and full closures of roadway would only be required for construction equipment and material deliveries and similar activities. The temporary closures would occur as needed, during construction hours, or for an extended period for specific activities such as utilities trenching. During the closure of roadway, vehicular and pedestrian traffic would be rerouted to another campus entry point and pathways. The traffic management plan would provide for flagmen to manage vehicle traffic and ensure that emergency access is maintained in the vicinity of construction activities. With the implementation of traffic management plan, potential conflicts between emergency vehicles and construction activities and other emergency access impacts would be reduced to less than significant level. Also, the proposed project would not require changes in the operational design of streets or the development of new streets. Lastly, implementation of traffic management plan would reduce impacts to bicycle and pedestrian facilities and bus services to less than significant level.

As previously stated, the project site is located within the Long Beach TPA and is presumed to have less than significant VMT impacts. Due to its close proximity to high quality transit, the public is provided with different transportation modes other than driving. Thus, the proposed project has a potential to decrease the number of trips and/or the trip length around the project site, further decreasing VMT. In addition, the proposed project is a medical clinic facility which is anticipated to primarily contribute to and support local community needs and therefore mostly generate trips within the local area. Since the majority of the clinic patients are expected to come from within a 5-mile radius, the proposed project can reasonably be expected to reduce trips for local community residents to other clinics located outside of the service area, and would therefore decrease VMT compared to existing conditions. As such, for VMT assessment at the cumulative level, the proposed project would not have a significant impact on regional or City VMT. Therefore, the proposed project is not expected to trigger significant VMT impacts.

Appendices

Appendix A – Daily Vehicle Trip Generation

Appendix B – Vehicle Trip Generation - AM Peak Hour of Generator

Appendix C – Vehicle Trip Generation - PM Peak Hour of Generator

<u>Reference</u>

Fehr & Peers (2019). California State University Transportation Impact Study Manual. March 11, 2019

Probst, J.C., Laditka, S.B,, Wang, J., & Johnson, A.O (2006). *Mode of Travel and Actual Distance Traveled For Medical or Dental Care by Rural and Urban Residents*. South Carolina Rural Health Research Center, May 2006

Appendix A

Daily Vehicle Trip Generation

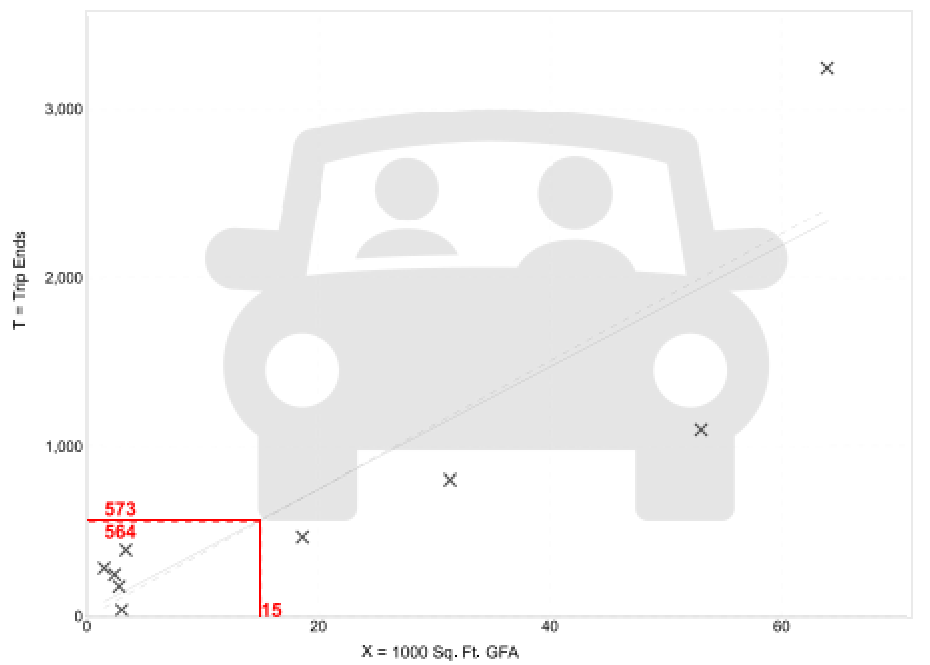
Clinic
(630)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	9
Avg. 1000 Sq. Ft. GFA:	20
Directional Distribution:	50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
37.60	13,96 - 191,33	25,52

Data Plot and Equation



Study Site — Fitted Curve — Average Rate

Fitted Curve Equation: T = 35.86(X) + 34.88 R^2= 0.76

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AECOM

Appendix B

Vehicle Trip Generation - AM Peak Hour of Generator

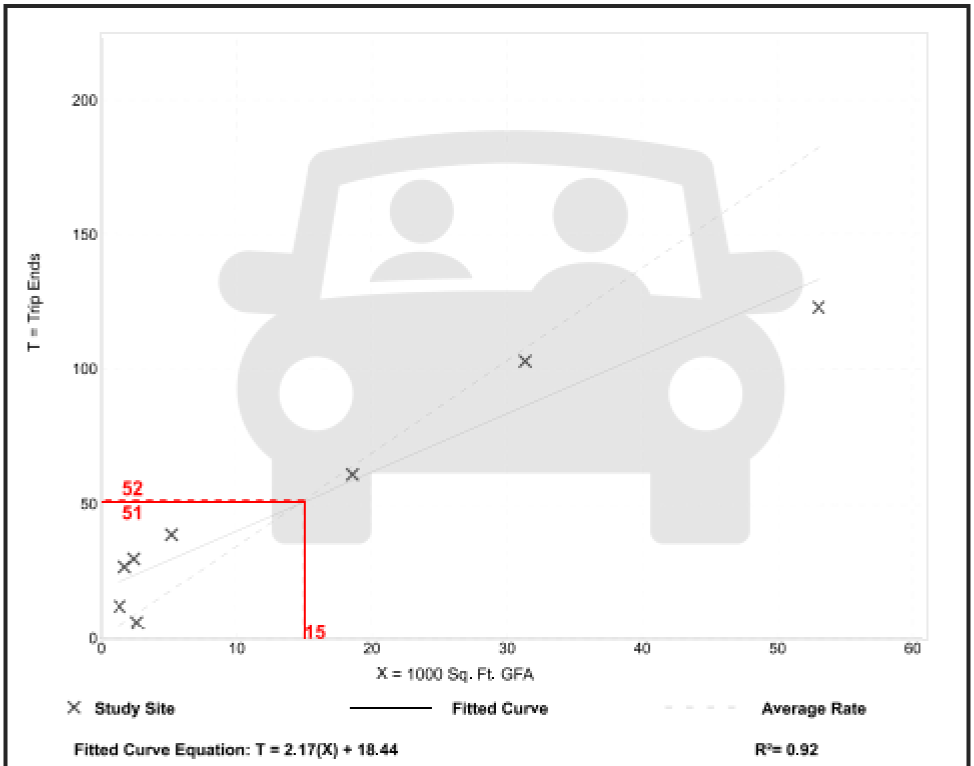
Clinic
(630)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, AM Peak Hour of Generator**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	8
Avg. 1000 Sq. Ft. GFA:	15
Directional Distribution:	60% entering, 40% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.44	2.22 - 15.00	2.45

Data Plot and Equation



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Appendix C

Vehicle Trip Generation - PM Peak Hour of Generator

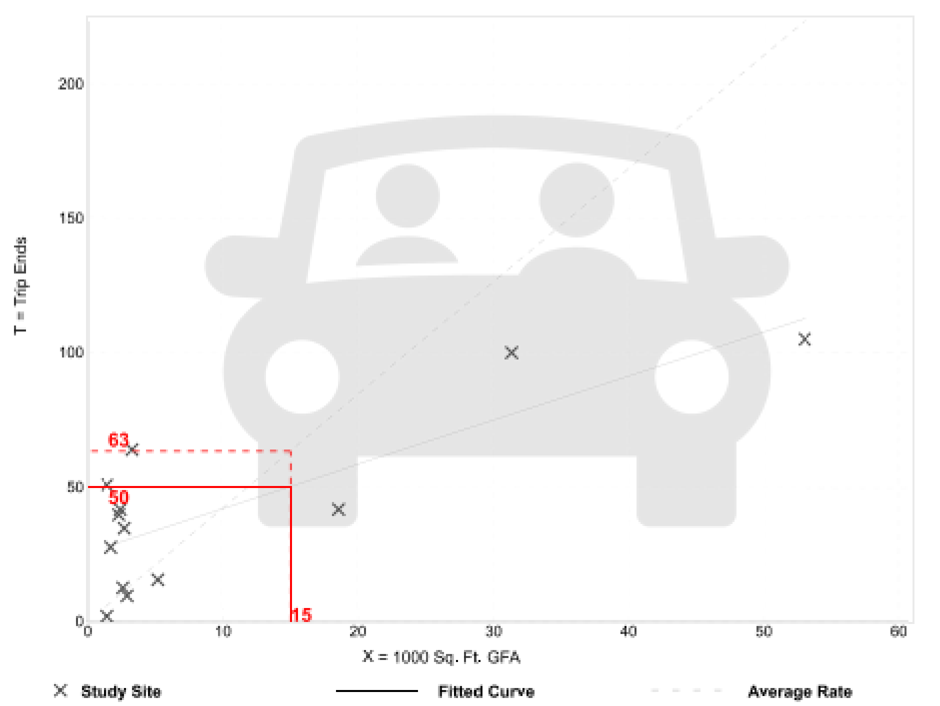
Clinic
(630)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday, PM Peak Hour of Generator**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	13
Avg. 1000 Sq. Ft. GFA:	10
Directional Distribution:	46% entering, 54% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.22	1.43 - 34.00	5.52

Data Plot and Equation



Fitted Curve Equation: $T = 1.64(X) + 25.76$ $R^2 = 0.64$

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