SECTION 3.2
AIR QUALITY

3.2 AIR QUALITY

3.2.1 INTRODUCTION

This section analyzes the proposed project's potential impacts to air quality, and is based on the Air Quality Technical Report prepared by Scientific Resources Associated (May 2007). A copy of the report is included as Appendix C in this EIR.

3.2.2 METHODOLOGY

To gauge the potential significance of air quality impacts associated with the proposed project, emissions associated with both construction and operation of the proposed project were estimated and, together with existing background air quality levels, were measured against applicable air quality standards. Emissions attributable to both construction activities and project operation were calculated using the California Air Resources Board URBEMIS2002 computer model, applied against relevant City of San Diego and San Diego Air Pollution Control District criteria.

3.2.3 EXISTING CONDITIONS

3.2.3.1 Climate

The SDSU Campus is located in central San Diego, south of Interstate 8 ("I-8") at College Avenue. The campus is located in the San Diego Air Basin ("SDAB"). The climate of the SDAB is dominated by a semi-permanent high pressure cell located over the Pacific Ocean. This cell influences the direction of prevailing winds (westerly to northwesterly) and maintains clear skies for much of the year. The high pressure cell also creates two types of temperature inversions that may act to degrade local air quality.

The climate of the SDSU area of San Diego is characterized by a repetitive pattern of frequent early morning cloudiness, hazy afternoon sunshine, clean daytime onshore breezes and little temperature change throughout the year. Limited rainfall occurs in the winter, while summers are often completely dry. An average of 10 inches of rain falls each year from mid-November to early April. Unfortunately, the same atmospheric conditions that create a desirable living climate combine to limit the ability of the atmosphere to disperse the air pollution generated by the large population attracted by the climate. The onshore winds across the coastline diminish quickly when they reach the foothill communities east of San Diego, and the sinking air within the offshore high pressure system forms a massive temperature inversion that traps all air pollutants near the ground. The resulting horizontal and vertical stagnation, in conjunction with ample sunshine, cause a number of reactive pollutants to undergo photochemical reactions and form smog that degrades visibility and irritates tear ducts and nasal membranes. High smog levels in coastal communities occasionally occur when polluted air from the South Coast (Los Angeles) Air Basin drifts seaward and southward at night, and then blows onshore the next day. Such weather patterns are particularly frustrating because no matter what San Diego County does to achieve clean air, such interbasin transport will cause occasionally unhealthy air over much of the County despite its best air pollution control efforts.

3.2.3.2 Regulatory Setting

Air quality is defined by ambient air concentrations of specific pollutants identified by the United States Environmental Protection Agency ("EPA") to be of concern with respect to health and welfare of the general public. The EPA is responsible for enforcing the Federal Clean Air Act of 1970 and its 1977 and 1990 Amendments ("CAA"). The CAA required the EPA to establish National Ambient Air Quality Standards ("NAAQS"), which identify concentrations of pollutants in the ambient air below which no adverse effects on the public health and welfare are anticipated. In response, the USEPA established both primary and secondary standards for several pollutants (called "criteria" pollutants). Primary standards are designed to protect human health with an adequate margin of safety. Secondary standards are designed to protect property and the public welfare from air pollutants in the atmosphere.

In September 1997, the EPA promulgated 8-hour ozone ("O_3") and 24-hour and annual national standards for particulate matter less than 2.5 microns in diameter ("$PM_{2.5}$ "). However, due to a lawsuit in May 1999, the United States District Court rescinded these standards and the EPA's authority to enforce them. Subsequent to an appeal of this decision by the EPA, the United States Supreme Court upheld these standards in February 2001. As a result, this action has initiated a new planning process to monitor and evaluate emission control measures for these pollutants. The EPA is moving forward to develop policies to implement these standards.

The CAA allows states to adopt ambient air quality standards and other regulations provided they are at least as stringent as federal standards. The California Air Resources Board ("ARB") has established the more stringent California Ambient Air Quality Standards (CAAQS) for the six criteria pollutants through the California Clean Air Act of 1988, and also has established CAAQS for additional pollutants, including sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles. Areas that do not meet the NAAQS or the CAAQS for a particular pollutant are considered to be "nonattainment areas" for that pollutant. On April 15, 2004, the SDAB was designated a basic nonattainment area for the 8-hour NAAQS for O_3, and on

December 15, 2005, the 1-hour NAAQS for O_3 was rescinded. In December 2006, the annual NAAQS for particulate matter less than 10 microns in diameter ("PM_{10}) also was rescinded. The SDAB is in attainment for the NAAQS for all other criteria pollutants. The SDAB is currently classified as a nonattainment area under the CAAQS for O_3 and PM_{10}.

The ARB is the state regulatory agency with authority to enforce regulations to both achieve and maintain the NAAQS and CAAQS. The ARB is responsible for the development, adoption, and enforcement of the state's motor vehicle emissions program, as well as the adoption of the CAAQS. The ARB also reviews operations and programs of the local air districts, and requires each air district with jurisdiction over a nonattainment area to develop its own strategy for achieving the NAAQS and CAAQS. The local air district has the primary responsibility for the development and implementation of rules and regulations designed to attain the NAAQS and CAAQS, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations. The San Diego APCD is the local agency responsible for the administration and enforcement of air quality regulations for San Diego County.

The APCD and the San Diego Association of Governments ("SANDAG") are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The San Diego County Regional Air Quality Strategy ("RAQS") was initially adopted in 1991, and is updated on a triennial basis, most recently in 2004. The RAQS outlines APCD's plans and control measures designed to attain the state air quality standards for O_3. The APCD also has developed the air basin's input to the State Implementation Plan ("SIP"), which is required under the CAA for areas that are out of attainment of air quality standards. The SIP includes the San Diego APCD's plans and control measures for attaining the O_3 NAAQS. The SIP also is updated on a triennial basis. The latest SIP update was submitted by the ARB to the EPA in 1998. The attainment schedule in the SIP called for the SDAB to attain the 1-hour NAAQS for O_3 by 1999, a goal which was met in the SDAB. The latest update to the SIP, which is under preparation, will set a new attainment date for the 8-hour NAAQS for O_3.

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

The SIP relies on the same information from SANDAG to develop emission inventories and emission reduction strategies that are included in the attainment demonstration for the air basin. The SIP also includes rules and regulations that have been adopted by the San Diego APCD to control emissions from stationary sources. These SIP-approved rules may be used as a guideline to determine whether a project's emissions would have the potential to conflict with the SIP and, thereby, hinder attainment of the NAAQS for O_3.

3.2.3.3 Criteria Pollutant Health Effects

The following is a description of the potential health effects of each of the criteria air pollutants based on EPA (2005a) and ARB (2001):

Ozone. O_3 is considered a photochemical oxidant, which is a chemical that is formed when volatile organic compounds ("VOCs") and nitrogen oxide ("NOx"), both byproducts of combustion, react in the presence of ultraviolet light. Ozone is considered a respiratory irritant and prolonged exposure can reduce lung function, aggravate asthma, and increase susceptibility to respiratory infections. Children and those with existing respiratory diseases are at greatest risk from exposure to ozone.

Carbon Monoxide. CO is a product of combustion, and the main source of CO in the SDAB is from motor vehicle exhaust. CO is an odorless, colorless gas. CO affects red blood cells in the body by binding to hemoglobin and reducing the amount of oxygen that can be carried to the body's organs and tissues. CO can cause health effects to those with cardiovascular disease, and also can affect mental alertness and vision.

Nitrogen Dioxide. NO_2 also is a by-product of fuel combustion, and is formed both directly as a product of combustion and in the atmosphere through the reaction of NO with oxygen. NO_2

is a respiratory irritant and may affect those with existing respiratory illness, including asthma. NO_2 also can increase the risk of respiratory illness.

Particulate and Fine Particulate Matter. Particulate matter, or PM_{10}, refers to particulate matter with an aerodynamic diameter of 10 microns or less. Fine particulate matter, or $PM_{2.5}$, refers to particulate matter with an aerodynamic diameter of 2.5 microns or less. Particulate matter in this size range has been determined to have the potential to lodge in the lungs and contribute to respiratory problems. PM_{10} and $PM_{2.5}$ arise from a variety of sources, including road dust, diesel exhaust, combustion, tire and brake wear, construction operations, and windblown dust. PM_{10} and $PM_{2.5}$ can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases such as asthma and chronic bronchitis. $PM_{2.5}$ is considered to have the potential to lodge deeper in the lungs.

Sulfur Dioxide. SO_2 is a colorless, reactive gas that is produced from the burning of sulfur-containing fuels such as coal and oil, and by other industrial processes. Generally, the highest concentrations of SO_2 are found near large industrial sources. SO_2 is a respiratory irritant that can cause narrowing of the airways leading to wheezing and shortness of breath. Long-term exposure to SO_2 can cause respiratory illness and aggravate existing cardiovascular disease.

Lead. Lead ("Pb") in the atmosphere occurs as particulate matter. Lead historically has been emitted from vehicles combusting leaded gasoline, as well as from industrial sources. With the phase-out of leaded gasoline, large manufacturing facilities are the sources of the largest amounts of lead emissions. Lead has the potential to cause gastrointestinal, central nervous system, kidney, and blood diseases upon prolonged exposure. Lead also is classified as a probable human carcinogen.

Sulfates. Sulfates are the fully oxidized ionic form of sulfur. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (*e.g.*, gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to sulfur dioxide ("SO_2") during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features. The ARB's sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms, and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility, and, due to fact that they usually are acidic, can harm ecosystems, and damage materials and property.

Hydrogen Sulfide. H_2S is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation. Breathing H_2S at levels above the standard would result in exposure to a very disagreeable odor. In 1984, an ARB committee concluded that the ambient standard for H_2S is adequate to protect public health and to significantly reduce odor annoyance.

Vinyl Chloride. Vinyl chloride, a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride ("PVC") plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, resulting from the microbial breakdown of chlorinated solvents. Short-term exposure to high levels of vinyl chloride in air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure to vinyl chloride through inhalation and oral exposure causes liver damage. Cancer is a major concern from exposure to vinyl chloride *via* inhalation. Vinyl chloride exposure has been shown to increase the risk of angiosarcoma, a rare form of liver cancer, in humans.

3.2.3.4 Criteria Pollutant Ambient Air Quality Standards

Table 3.2-1, Ambient Air Quality Standards, presents a summary of the state and federal ambient air quality standards for each of the criteria pollutants.

Table 3.2-1
Ambient Air Quality Standards

Pollutant	Average Time	California Standards		National Standards		
		Concentration	Method	Primary	Secondary	Method
Ozone	1 hour	0.09 ppm (180 μg/m³)	Ultraviolet Photometry	--	--	Ethylene Chemiluminescence
	8 hour	0.070 ppm (137 μg/m³)		0.08 ppm (157 μg/m³)	0.08 ppm (157 μg/m³)	
Carbon Monoxide	8 hours	9.0 ppm (10 mg/m³)	Non-Dispersive Infrared Spectroscopy (NDIR)	9 ppm (10 mg/m³)	None	Non-Dispersive Infrared Spectroscopy (NDIR)
	1 hour	20 ppm (23 mg/m³)		35 ppm (40 mg/m³)		
Nitrogen Dioxide (NO_2)	Annual Average[1]	--	Gas Phase Chemiluminescence	0.053 ppm (100 μg/m³)	0.053 ppm (100 μg/m³)	Gas Phase Chemiluminescence
	1 hour[1]	0.25 ppm (470 μg/m³)		--	--	
Sulfur Dioxide (SO_2)	Annual Average	--	Ultraviolet Fluorescence	0.03 ppm (80 μg/m³)	--	Pararosaniline
	24 hours	0.04 ppm (105 μg/m³)		0.14 ppm (365 μg/m³)	--	
	3 hours	--		--	0.5 ppm (1300 μg/m³)	
	1 hour	0.25 ppm (655 μg/m³)		--	--	
Respirable Particulate Matter (PM_{10})	24 hours	50 μg/m³	Gravimetric or Beta Attenuation	--	--	Inertial Separation and Gravimetric Analysis
	Annual ArithmeticMean	20 μg/m³		50 μg/m³	50 μg/m³	
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 μg/m³	Gravimetric or Beta Attenuation	15 μg/m³	--	Inertial Separation and Gravimetric Analysis
	24 hours	--		35 μg/m³	--	
Sulfates	24 hours	25 μg/m³	Ion Chromatography	--	--	--
Lead	30-day Average	1.5 μg/m³	Atomic Absorption	--	--	Atomic Absorption
	Calendar Quarter	--		1.5 μg/m³	1.5 μg/m³	
Hydrogen Sulfide	1 hour	0.03 ppm (42 μg/m³)	Ultraviolet Fluorescence	--	--	--
Vinyl Chloride	24 hour	0.01 ppm (26 μg/m³)	Gas Chromatography	--	--	--

Notes:
ppm= parts per million
μg/m³ = micrograms per cubic meter
mg/m³= milligrams per cubic meter
[1]On February 22, 2007, the ARB approved staff recommendations to adopt lower annual and 1-hour NO_2 standards. The new standards will be 0.18 ppm (1 hour) and 0.030 ppm (annual).
Source: California Air Resources Board March 2007.

3.2.3.5 Background Air Quality

The San Diego APCD operates a network of ambient air monitoring stations throughout San Diego County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the state ("CAAQS") and federal ("NAAQS") ambient air quality standards. The nearest ambient monitoring station to the SDSU campus that measures all pollutants was the San Diego 12th Avenue monitoring station, which ceased operation in mid-2005. The other monitoring stations in the project vicinity are the San Diego Union Street monitoring station, located downtown; the El Cajon monitoring station, located east of the campus in the El Cajon valley; and the Overland Avenue monitoring station. The Union Street station measures CO, the El Cajon monitoring station measures O_3, PM_{10}, $PM_{2.5}$, and NO_2., and the Overland Avenue monitoring station also measures O_3, PM_{10}, $PM_{2.5}$, and NO_2. The Overland Avenue monitoring station is most representative of the SDSU area because the El Cajon monitoring station is located farther inland and is subject to higher ambient concentrations due to pollutants being trapped in the valley.

Ambient concentrations of the criteria pollutants over the last three years for the 12th Avenue monitoring station (2004), the Overland Avenue monitoring station (2005 and 2006 for O_3, PM_{10}, $PM_{2.5}$, and NO_2), and the El Cajon monitoring station (CO) are presented in **Table 3.2-2, Ambient Background Concentrations.**

Table 3.2-2
Ambient Background Concentrations
(ppm unless otherwise indicated)

Pollutant	Averaging Time	2004	2005	2006	Most Stringent Ambient Air Quality Standard	Monitoring Station
Ozone	8 hour	0.071	0.072	0.091	0.070	12th Ave./Overland Ave.
	1 hour	0.093	0.084	0.108	0.09	12th Ave./Overland Ave.
PM_{10}	Annual	33.2	22.3	21.6	20 μg/m³	12th Ave./Overland Ave.
	24 hour	71	44	34	50 μg/m³	12th Ave./Overland Ave.
$PM_{2.5}$	Annual	13.8	10.2	11.2	12 μg/m³	12th Ave./Overland Ave.
	24 hour	42.9	29.0	26.3	35 μg/m³	12th Ave./Overland Ave.
NO_2	Annual	0.020	0.017	0.015	0.053	12th Ave./Overland Ave.
	1 hour	0.094	0.076	0.071	0.25	12th Ave./Overland Ave.
CO	8 hour	4.04	3.89	3.50	9.0	12th Ave./Union Street
	1 hour	4.9	5.3	5.0	20	12th Ave./Union Street
SO_2	Annual	0.004	0.002	N/A	0.03	12th Ave.
	24 hour	0.008	0.007	N/A	0.04	12th Ave.
	3 hour	0.020	0.019	N/A	0.5[1]	12th Ave.
	1 hour	0.042	0.040	N/A	0.25	12th Ave.

Notes:
N/A = Not Available
[1]New CAAQS proposed by ARB
[2]Secondary NAAQS
Source: www.arb.ca.gov/aqd/aqd.htm (Measurements of all pollutants at Escondido-E Valley Parkway station, except SO_2,) www.epa.gov/air/data/monvals.html (1-hour and 3-hour SO_2 and 1-hour CO).

The federal 8-hour ozone standard, which was formally adopted in 2001, was exceeded at the Overland Avenue monitoring station once during the year 2006. The 12th Avenue monitoring station measured exceedances of the state PM_{10} and $PM_{2.5}$ standards in 2004. The SDAB is classified as non-attainment for the 8-hour NAAQS for O_3. The data from the monitoring stations indicate that air quality is in attainment of all other federal standards.

3.2.4 THRESHOLDS OF SIGNIFICANCE

Under CEQA Guidelines Appendix G, the proposed project may result in a potentially significant impact to air quality if the project would:

a) Conflict with or obstruct the implementation of the San Diego Regional Air Quality Strategy or applicable portions of the State Implementation Plan;

b) Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation;

c) Result in a cumulatively considerable net increase of PM_{10} or exceed quantitative thresholds for O_3 precursors, NO_X,, and VOCs;

d) Expose sensitive receptors (including, but not limited to, schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations;

e) Create objectionable odors affecting a substantial number of people; or

f) Release air contaminants beyond the boundaries of the premises upon which the use emitting the contaminants is located.

To determine whether a project would (a) result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation; or (b) result in a cumulatively considerable net increase of PM_{10} or exceed quantitative thresholds for O_3 precursors, NO_X and VOCs, project emissions were evaluated based on the quantitative emission thresholds established by the San Diego APCD. As part of its air quality permitting process, the APCD has established thresholds in Rule 20.2 for the preparation of Air Quality Impact Assessments ("AQIA").

For CEQA purposes, these screening criteria can be used as numeric methods to demonstrate that a project's total emissions would not result in a significant impact to air quality. Since the San Diego APCD does not have AQIA thresholds for emissions of VOCs, the use of the threshold for VOCs from the City of San Diego's Significance Thresholds (City of San Diego 2004) were utilized. **Table 3.2-3, Screening-Level Criteria for Air Quality Impacts**, lists the applicable criteria for assessing the proposed project's potential impacts to air quality.

Table 3.2-3
Screening-Level Criteria for Air Quality Impacts

Pollutant	**Total Emissions**		
Construction Emissions			
	Lb. per Day		
Respirable Particulate Matter (PM_{10})	100		
Fine Particulate Matter ($PM_{2.5}$)	100		
Oxides of Nitrogen (NOx)	250		
Oxides of Sulfur (SOx)	250		
Carbon Monoxide (CO)	550		
Volatile Organic Compounds (VOCs)[1]	137		
Operational Emissions			
	Lb. Per Hour	Lb. per Day	Tons per Year
Respirable Particulate Matter (PM_{10})	---	100	15
Fine Particulate Matter ($PM_{2.5}$)	---	100	15
Oxides of Nitrogen (NOx)	25	250	40
Oxides of Sulfur (SOx)	25	250	40
Carbon Monoxide (CO)	100	550	100
Lead and Lead Compounds	---	3.2	0.6
Volatile Organic Compounds (VOC)[2]	---	137	15

The thresholds listed in **Table 3.2-3** represent screening-level thresholds that can be used to evaluate whether project-related emissions would cause a significant impact on air quality. Emissions below the screening-level thresholds would not cause a significant impact. In the event that emissions exceed these thresholds, modeling would be required to demonstrate that the project's total air quality impacts result in ground-level concentrations that are below the State and Federal Ambient Air Quality Standards, including appropriate background levels. For nonattainment pollutants (ozone, with ozone precursors NOx and VOCs, and PM_{10}), if emissions exceed the thresholds shown in Table 3.2-3, the project could have the potential to result in a cumulatively considerable net increase in these pollutants and, thus, could have a significant impact on the ambient air quality.

In addition to potential impacts from criteria pollutants, project impacts may include the emission of pollutants identified by the state and federal government as toxic air contaminants ("TACs") or Hazardous Air Pollutants ("HAPs"). In San Diego County, APCD Regulation XII establishes acceptable risk levels and emission control requirements for new and modified facilities that may emit additional TACs. Under Rule 1210, emissions of TACs that result in a cancer risk of 10 in 1 million or less, and a health hazard index of one or less, would not be required to notify the public of potential health risks. If a project has the potential to result in emissions of any TAC or HAP which result in a cancer risk of greater than 10 in 1 million, the project would be deemed to have a potentially significant impact.

With regard to evaluating whether a project would have a significant impact on sensitive receptors, air quality regulators typically define sensitive receptors as schools (Preschool-12th Grade), hospitals, resident care facilities, or day-care centers, or other facilities that may house individuals with health conditions that would be adversely impacted by changes in air quality. Any project that has the potential to directly impact a sensitive receptor located within 1 mile, and that results in a health risk greater than 10 in 1 million, would be deemed to have a potentially significant impact.

APCD Rule 51 (Public Nuisance) also prohibits the emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health or safety of any person. A project that proposes a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of offsite receptors.

The impacts associated with the construction and operation of the proposed project were evaluated for significance based on these significance criteria.

3.2.5 IMPACTS ANALYSIS

This section presents an evaluation of the potential impacts associated with construction and operation of the proposed project.

3.2.5.1 Construction Activity Impacts

3.2.5.1.1 Construction Phasing

Implementation of the proposed project would entail construction of the following facilities:

Adobe Falls – Development of up to 348 residential dwelling units and related infrastructure;

Alvarado Campus – Demolition of 128,678 gross square feet ("GSF") of existing space, and development of 612,285 GSF of new space;

Alvarado Hotel – Development of a 60,000 GSF six-story building;

Student Housing – Development of multiple components of new student housing. First component: development of a 10-story, 350,000 GSF structure; Second component: demolition of the existing Olmeca and Maya residence halls and the existing Office of Housing Administration and Residential Education office (Building 40), and the subsequent construction of two replacement 10-story, 350,000 GSF structures, and a two-story, 15,000 GSF structure. Third component: development of a 10-story, 350,000 GSF structure; and long-term development of 50 two-bedroom apartments in 2-3-story structures;

Student Union – Development of a 70,000 GSF expansion, and renovation of, the existing Aztec Center; and,

Campus Conference Center – Development of a 70,000 GSF three-story conference center.

Based on information provided by SDSU, it is anticipated that the initial two phases of construction would involve the following project components:

- First Phase: Student Union expansion/renovation; Alvarado Hotel; and the first component of Student Housing.
- Second Phase: Student Housing second component; and the Adobe Falls Upper Village.

The schedule for construction of the remaining facilities that comprise the proposed project is unknown at this time. Therefore, the analysis assumes all remaining project components will be constructed during one final phase. By assuming all remaining project components are constructed during one phase, the analysis effectively presents a worse-case scenario in terms of construction-related emissions.

3.2.5.1.2 Overview

Construction activities, including soil disturbance dust emissions and combustion pollutants from on-site construction equipment and from off-site trucks hauling dirt, cement or building materials, will create a temporary addition of pollutants to the local airshed. These emissions are quite variable in both time and space and differ considerably among various construction projects. Such emission levels can, therefore, only be approximately estimated with a corresponding uncertainty in precise ambient air quality impacts. Because of their temporary nature, construction activity impacts have often been considered as having a less-than-significant air quality impact. However, the cumulative impact from all simultaneous construction in the basin is a major contributor to the overall pollution burden, especially for PM_{10}. A number of current San Diego APCD strategies, thus, focus on dust control and on using cleaner off-road equipment to reduce the role of construction in the poor air quality of the region.

Three types of dust emissions are associated with construction activities -- large particulates, PM_{10}, and $PM_{2.5}$. Large particulates are generated and rapidly settle out in close proximity to the source. A fraction of the material is small enough to remain suspended in the air semi-indefinitely. The size cut-off for these total suspended particulates ("TSP") is around 30 microns in diameter. PM_{10} represents a fraction of TSP that is small enough to enter deep lung tissue. The PM_{10} fraction of TSP is assumed to be around 50 percent. PM2.5, which is particulate matter that is 2.5 microns or less, is a fraction of the PM_{10} emissions, ranging from 21 percent to 99 percent (South Coast Air Quality Management District ("SCAQMD") 2006).

3.2.5.1.3 Demolition Emissions

The proposed project involves demolition activities, which are separate from generic grading activities and, consequently, emissions from the demolition activities were calculated separately. The demolition of existing buildings will generate dust as walls are pulled down and concrete foundations are broken up. The PM_{10} emission factor for demolition activities, as provided in the SCAQMD CEQA Air Quality Handbook (1993), is 42 pounds per 100,000 cubic feet of demolition volume. While it is known that 120,000 GSF of building space is to be demolished, the volume and rate of demolition is unknown. For purposes of this analysis, therefore, it is assumed that each building has a ceiling height of twelve feet. The total volume of space to be demolished, therefore, is roughly estimated at 1,440,000 cubic feet (cf) (120,000 sf x 12 feet = 1,440,000).

If demolition of all structures occurred in one day, these activities would generate approximately 604.8 pounds of PM_{10} emissions. Realistically, however, demolition activities typically involve about 50,000 cubic feet of building per day, and the rate of demolition activities typically lasts numerous days. Assuming, as a worst-case scenario, a demolition volume of 50,000 cubic feet per day, PM_{10} emissions would be 21 pounds per day (50,000 cubic feet ÷ 100,000 cubic feet x 42 pounds per day = 21 pounds per day). Based on the applicable significance threshold of 100 pounds per day, project-related demolition activities involving 50,000 cubic feet of building space per day would not result in potentially significant impacts relating to PM_{10} dust emissions.

3.2.5.1.4 Equipment Emissions

The on-site heavy equipment operations will generate diesel exhaust emissions. The heavy equipment exhaust will be released during project construction activities from mobile sources during site preparation. Emissions also will be generated during finish construction, especially during application of paints or other coatings. On-site, diesel-powered construction equipment will create gaseous and particulate tailpipe emissions that are not regulated by smog control rules such as for on-road sources. Based on information provided by SDSU for similar construction projects, it is anticipated that surface preparation activities would not require major mass grading. In general, surface preparation activities would require backhoes and trucks. At the Student Union site, it is anticipated that up to 10,000 cubic yards of export would be required. All other sites were assumed to require no import or export, and would either balance on site or would not require major cut and fill.

The majority of building construction activities would require forklifts to transport building materials, and hand tools. Larger buildings (*i.e.*, the 10-story Student Housing buildings) would require a tower crane and other buildings were assumed to require one man-lift. On-site paving would be minimal.

Table 3.2-4 through **Table 3.2-6**, respectively, present an estimate of the maximum daily construction emissions, based on the URBEMIS2002 model results, for the first, second, and subsequent phases of project construction. The model results are based on the assumption that all projects identified for that particular construction phase would be undertaken simultaneously. This assumption represents a worst case scenario as it is unlikely that each project would be undergoing maximum construction activity at the same time. It was assumed that standard dust control measures would be implemented during construction, including watering active sites a minimum of three times daily, watering unpaved roads, and reducing vehicle speeds to 15 mph or less on unpaved surfaces. Because the URBEMIS model does not provide estimates of $PM_{2.5}$, emissions of $PM_{2.5}$ were estimated based on the SCAQMD guidelines (SCAQMD 2006), assuming that fugitive dust PM_{10} is 21% $PM_{2.5}$, offroad equipment PM_{10} is 89% $PM_{2.5}$, and on-road vehicle PM_{10} is 99% $PM_{2.5}$.

Table 3.2-4
First Phase Construction Emissions

Construction Project/Phase	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Student Union						
Grading						
Fugitive Dust	-	-	-	-	0.25	0.05
Off-Road Diesel	5.54	35.77	45.50	-	1.36	1.21
On-Road Diesel	0.56	10.75	2.05	0.02	0.28	0.28
Worker Trips	0.05	0.13	1.28	0.00	0.00	0.00
Total	**6.15**	**46.65**	**48.83**	**0.02**	**1.89**	**1.54**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Building Construction						
Building Construction Off-Road Diesel	5.31	33.94	43.33	-	1.17	1.04
Building Construction Worker Trips	0.13	0.08	1.63	0.00	0.02	0.02
Architectural Coating Offgassing	14.70	-	-	-	-	-
Architectural Coatings Worker Trips	0.13	0.08	1.63	0.00	0.02	0.02
Total	**20.27**	**34.10**	**46.59**	**0.00**	**1.21**	**1.08**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Alvarado Hotel						
Grading						
Fugitive Dust	-	-	-	-	1.15	0.24
Off-Road Diesel	5.54	35.77	45.50	-	1.36	1.21
Worker Trips	0.05	0.13	1.28	0.00	0.00	0.00
Total	**5.59**	**35.90**	**46.78**	**0.00**	**2.51**	**1.45**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Building Construction						
Building Construction Off-Road Diesel	4.52	29.38	36.64	-	1.05	0.93
Building Construction Worker Trips	0.11	0.07	1.40	0.00	0.02	0.02
Architectural Coating Offgassing	12.60	-	-	-	-	-
Architectural Coatings Worker Trips	0.11	0.07	1.40	0.00	0.02	0.02
Asphalt Offgassing	0.17	-	-	-	-	-
Asphalt Off-Road Diesel	1.37	7.96	11.66	-	0.22	0.20
Asphalt On-Road Diesel	0.03	0.66	0.12	0.00	0.01	0.01
Asphalt Worker Trips	0.01	0.00	0.07	0.00	0.00	0.00
Total	**18.92**	**38.14**	**51.29**	**0.00**	**1.32**	**1.18**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Table 3.2-4
First Phase Construction Emissions

Construction Project/Phase	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Student Housing – Phase 1						
Building Construction						
Building Construction Off-Road Diesel	22.27	148.29	178.57	-	5.55	4.94
Building Construction Worker Trips	1.56	0.96	20.28	0.00	0.30	0.30
Architectural Coating Offgassing	182.70[a]	-	-	-	-	-
Architectural Coatings Worker Trips	1.56	0.96	20.28	0.00	0.30	0.30
Asphalt Offgassing	0.24	-	-	-	-	-
Asphalt Off-Road Diesel	3.78	23.45	31.28	-	0.76	0.68
Asphalt On-Road Diesel	0.05	0.94	0.18	0.00	0.02	0.02
Asphalt Worker Trips	0.03	0.02	0.36	0.00	0.00	0.00
Total	**210.63[a]**	**174.62**	**250.94**	**0.00**	**6.93**	**6.24**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**Yes**	**No**	**No**	**No**	**No**	**No**
TOTAL FIRST PHASE[b]	**249.82[a]**	**246.86**	**348.82**	**0.00**	**9.46**	**8.50**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**Yes**	**No**	**No**	**No**	**No**	**No**

Notes:
[a] Exceeds threshold due to application of paints and coatings.
[b] Assuming simultaneous building construction phases.

Table 3.2-5
Second Phase Construction Emissions

Construction Project/Phase	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Student Housing – Phase 2						
Demolition						
Fugitive Dust	-	-	-	-	1.26	0.26
Off-Road Diesel	3.38	21.71	27.68	-	0.79	0.70
On-Road Diesel	0.19	3.58	0.69	0.01	0.10	0.10
Worker Trips	0.04	0.12	1.17	0.00	0.00	0.00
Total	**3.61**	**25.41**	**29.54**	**0.01**	**2.05**	**1.06**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Building Construction						
Building Construction Off-Road Diesel	22.27	143.19	182.20	-	5.25	4.67
Building Construction Worker Trips	1.42	0.88	18.70	0.00	0.30	0.30
Architectural Coating Offgassing	182.70[a]	-	-	-	-	-
Architectural Coatings Worker Trips	1.42	0.88	18.70	0.00	0.30	0.30
Asphalt Offgassing	0.12	-	-	-	-	-
Asphalt Off-Road Diesel	2.41	15.09	19.91	-	0.52	0.46
Asphalt On-Road Diesel	0.02	0.43	0.08	0.00	0.01	0.01
Asphalt Worker Trips	0.01	0.01	0.13	0.00	0.00	0.00
Total	**210.47[a]**	**160.48**	**239.72**	**0.00**	**6.38**	**5.74**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**Yes**	**No**	**No**	**No**	**No**	**No**
Adobe Falls – Upper Village						
Grading						
Fugitive Dust	-	-	-	-	26.20	5.50
Off-Road Diesel	13.47	83.36	113.07	-	3.00	2.67
Worker Trips	0.13	0.25	2.71	0.00	0.02	0.02
Total	**13.60**	**83.61**	**115.78**	**0.00**	**29.22**	**8.19**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Building Construction						
Building Construction Off-Road Diesel	7.47	47.99	61.11	-	1.76	1.57
Building Construction Worker Trips	0.34	0.21	4.47	0.00	0.07	0.07
Architectural Coating Offgassing	44.58	-	-	-	-	-
Architectural Coatings Worker Trips	0.34	0.21	4.47	0.00	0.07	0.07
Asphalt Offgassing	0.55	-	-	-	-	-
Asphalt Off-Road Diesel	4.00	23.39	33.99	-	0.68	0.61
Asphalt On-Road Diesel	0.10	1.96	0.38	0.00	0.04	0.04
Asphalt Worker Trips	0.02	0.01	0.27	0.00	0.00	0.00
Total	**57.40**	**73.77**	**104.69**	**0.00**	**2.62**	**2.36**

Table 3.2-5
Second Phase Construction Emissions

Construction Project/Phase	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
TOTAL SECOND PHASE[b]	**267.87[a]**	**234.25**	**344.41**	**0.00**	**9.00**	**8.10**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**Yes**	**No**	**No**	**No**	**No**	**No**

Notes:
[a] Exceeds threshold due to application of paints and coatings.
[b] Assuming simultaneous building construction phases.

Table 3.2-6
Remaining Projects - Construction Emissions

Construction Project/Phase	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
		Alvarado Campus				
Demolition						
Fugitive Dust	-	-	-	-	80.97	17.00
Off-Road Diesel	4.85	30.56	40.28	-	1.12	1.00
On-Road Diesel	10.97	202.27	40.65	0.50	5.64	5.58
Worker Trips	0.04	0.11	1.07	0.00	0.00	0.00
Total	**15.86**	**232.94**	**82.00**	**0.50**	**87.73**	**23.58**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Grading						
Fugitive Dust	-	-	-	-	11.55	2.43
Off-Road Diesel	9.83	59.51	82.83	-	0.21	0.21
Worker Trips	0.04	0.02	0.49	0.00	0.01	0.01
Total	**9.87**	**59.53**	**83.32**	**0.00**	**11.77**	**2.65**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Building Construction						
Building Construction Off-Road Diesel	18.67	115.98	155.70	-	4.07	3.62
Building Construction Worker Trips	0.90	0.57	12.11	0.00	0.21	0.21
Architectural Coating Offgassing	128.58	-	-	-	-	-
Architectural Coatings Worker Trips	0.90	0.57	12.11	0.00	0.21	0.21
Asphalt Offgassing	0.83	-	-	-	-	-
Asphalt Off-Road Diesel	10.36	60.85	87.80	-	1.76	1.57
Asphalt On-Road Diesel	0.14	2.62	0.53	0.01	0.06	0.01
Asphalt Worker Trips	0.04	0.03	0.56	0.00	0.01	0.01
Total	**160.42[a]**	**180.62**	**256.70**	**0.01**	**6.32**	**5.63**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**Yes**	**No**	**No**	**No**	**No**	**No**

Table 3.2-6 Remaining Projects - Construction Emissions						
Construction Project/Phase	**ROG**	**NOx**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Adobe Falls – Lower Village						
Grading						
Fugitive Dust	-	-	-	-	119.99	25.20
Off-Road Diesel	13.47	81.28	113.77	-	2.71	2.41
Worker Trips	0.11	0.22	2.48	0.00	0.02	0.02
Total	**13.58**	**81.50**	**116.25**	**0.00**	**122.72**	**27.63**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**Yes**	**No**
Building Construction						
Building Construction Off-Road Diesel	7.47	46.39	62.28	-	1.63	1.45
Building Construction Worker Trips	0.31	0.19	4.12	0.00	0.07	0.07
Architectural Coating Offgassing	44.58	-	-	-	-	-
Architectural Coatings Worker Trips	0.31	0.19	4.12	0.00	0.07	0.07
Asphalt Offgassing	0.55	-	-	-	-	-
Asphalt Off-Road Diesel	4.00	23.19	33.99	-	0.64	0.57
Asphalt On-Road Diesel	0.09	1.72	0.35	0.00	0.04	0.04
Asphalt Worker Trips	0.02	0.01	0.25	0.00	0.00	0.00
Total	**57.33**	**71.69**	**105.11**	**0.00**	**2.45**	**2.20**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Student Housing – Phases 3 and 4						
Building Construction						
Building Construction Off-Road Diesel	22.27	138.39	185.70	-	4.86	4.33
Building Construction Worker Trips	3.50	6.88	76.69	0.05	0.44	0.44
Architectural Coating Offgassing	182.70[a]	-	-	-	-	-
Architectural Coatings Worker Trips	1.29	0.81	17.21	0.00	0.30	0.30
Asphalt Offgassing	0.12	-	-	-	-	-
Asphalt Off-Road Diesel	2.41	14.71	20.19	-	0.49	0.44
Asphalt On-Road Diesel	0.02	0.37	0.08	0.00	0.01	0.01
Asphalt Worker Trips	0.01	0.01	0.12	0.00	0.00	0.00
Total	**212.32[a]**	**161.17**	**299.99**	**0.05**	**6.10**	**5.52**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**Yes**	**No**	**No**	**No**	**No**	**No**

Table 3.2-6 Remaining Projects - Construction Emissions						
Construction Project/Phase	**ROG**	**NOx**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Conference Center						
Building Construction						
Building Construction Off-Road Diesel	5.31	32.32	44.51	-	1.07	0.06
Building Construction Worker Trips	0.28	0.55	6.17	0.00	0.03	0.03
Architectural Coating Offgassing	14.70	-	-	-	-	-
Architectural Coatings Worker Trips	0.28	0.55	6.17	0.00	0.03	0.03
Total	**20.57**	**33.42**	**56.85**	**0.00**	**1.13**	**0.12**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Notes:

[a] Exceeds threshold due to application of paints and coatings.

As shown on **Table 3.2-4, First Phase Construction Emissions**, emissions of reactive organic gases ("ROG") would exceed the significance thresholds during the building construction phase for the first phase of construction as a result of the application of architectural coatings at the Student Housing, thereby resulting in potentially significant impacts. As shown on **Table 3.2-5, Second Phase Construction Emissions**, emissions of ROG also would exceed the significance thresholds during the second phase of building construction, also as a result of the application of architectural coatings at the Student Housing. And, as shown on **Table 3.2-6, Remaining Projects - Construction Emissions**, emissions of ROG also would exceed the significance thresholds during subsequent phases of building construction, as a result of the application of architectural coatings at the Student Housing and Alvarado Campus. Also as shown on **Table 3.2-6,** emissions of PM_{10} would exceed the applicable threshold for the grading phase of the Adobe Falls Lower Village due to the amount of cut and fill required. Therefore, construction-related ROG and PM_{10} emissions would result in potentially significant impacts.

The estimate of ROG emissions due to architectural coatings use from the URBEMIS2002 computer model presumes development completion within two work months. Because actual project build-out will be phased over a much longer period, the analysis results represent a worse-case scenario. Nevertheless, the following emissions reduction measures are recommended to reduce ROG emissions to the extent possible:

- Use pre-coated building materials;
- Use electrostatic spray, or hand paint applicators; and
- Use lower volatility paint not exceeding 100 grams of ROG per liter.

Based on the SCAQMD CEQA Air Quality Handbook (SCAQMD 1993), use of architectural coatings with a ROG content of 100 grams/liter or less, applied by hand (with brushes or rollers) or with electrostatic spray guns, would reduce emissions from 4.62 lbs/1000 square feet to 2.13 lbs/1000 square feet, a decrease in emissions of 54 percent. If pre-coated building materials were used for approximately 10 percent of the surfaces, and the above mitigation measures for paint and coatings were implemented, maximum daily ROG emissions (predicted for the second phase of construction) would be reduced from 267.87 pounds per day to approximately 134.52 pounds per day, which would be less than the significance threshold of 137 pounds per day. **Table 3.2-7** through **Table 3.2-9** depict the construction emission estimates for the first, second and subsequent phases of project construction with implementation of the proposed mitigation measures.

Table 3.2-7
First Phase Construction Emissions with Mitigation

Construction Project/Phase	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Student Union						
Grading						
Fugitive Dust	-	-	-	-	0.25	0.05
Off-Road Diesel	5.54	35.77	45.50	-	1.36	1.21
On-Road Diesel	0.56	10.75	2.05	0.02	0.28	0.28
Worker Trips	0.05	0.13	1.28	0.00	0.00	0.00
Total	**6.15**	**46.65**	**48.83**	**0.02**	**1.89**	**1.54**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Building Construction						
Building Construction Off-Road Diesel	5.31	33.94	43.33	-	1.17	1.04
Building Construction Worker Trips	0.13	0.08	1.63	0.00	0.02	0.02
Architectural Coating Offgassing	6.09	-	-	-	-	-
Architectural Coatings Worker Trips	0.13	0.08	1.63	0.00	0.02	0.02
Total	**11.66**	**34.10**	**46.59**	**0.00**	**1.21**	**1.08**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Table 3.2-7
First Phase Construction Emissions with Mitigation

Construction Project/Phase	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Alvarado Hotel						
Grading						
Fugitive Dust	-	-	-	-	1.15	0.24
Off-Road Diesel	5.54	35.77	45.50	-	1.36	1.21
Worker Trips	0.05	0.13	1.28	0.00	0.00	0.00
Total	**5.59**	**35.90**	**46.78**	**0.00**	**2.51**	**1.45**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Building Construction						
Building Construction Off-Road Diesel	4.52	29.38	36.64	-	1.05	0.93
Building Construction Worker Trips	0.11	0.07	1.40	0.00	0.02	0.02
Architectural Coating Offgassing	5.22	-	-	-	-	-
Architectural Coatings Worker Trips	0.11	0.07	1.40	0.00	0.02	0.02
Asphalt Offgassing	0.17	-	-	-	-	-
Asphalt Off-Road Diesel	1.37	7.96	11.66	-	0.22	0.20
Asphalt On-Road Diesel	0.03	0.66	0.12	0.00	0.01	0.01
Asphalt Worker Trips	0.01	0.00	0.07	0.00	0.00	0.00
Total	**11.54**	**38.14**	**51.29**	**0.00**	**1.32**	**1.18**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Student Housing – Phase 1						
Building Construction						
Building Construction Off-Road Diesel	22.27	148.29	178.57	-	5.55	4.94
Building Construction Worker Trips	1.56	0.96	20.28	0.00	0.30	0.30
Architectural Coating Offgassing	75.64	-	-	-	-	-
Architectural Coatings Worker Trips	1.56	0.96	20.28	0.00	0.30	0.30
Asphalt Offgassing	0.24	-	-	-	-	-
Asphalt Off-Road Diesel	3.78	23.45	31.28	-	0.76	0.68
Asphalt On-Road Diesel	0.05	0.94	0.18	0.00	0.02	0.02
Asphalt Worker Trips	0.03	0.02	0.36	0.00	0.00	0.00
Total	**105.13**	**174.62**	**250.94**	**0.00**	**6.93**	**6.24**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
TOTAL FIRST PHASE[a]	**128.33**	**246.86**	**348.82**	**0.00**	**9.46**	**8.50**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**Yes**	**No**	**No**	**No**	**No**	**No**

Notes:

[a] Assuming simultaneous building construction phases.

Table 3.2-8
Second Phase Construction Emissions with Mitigation

Construction Project/Phase	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Student Housing – Phase 2						
Demolition						
Fugitive Dust	-	-	-	-	1.26	0.26
Off-Road Diesel	3.38	21.71	27.68	-	0.79	0.70
On-Road Diesel	0.19	3.58	0.69	0.01	0.10	0.10
Worker Trips	0.04	0.12	1.17	0.00	0.00	0.00
Total	**3.61**	**25.41**	**29.54**	**0.01**	**2.05**	**1.06**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Building Construction						
Building Construction Off-Road Diesel	22.27	143.19	182.20	-	5.25	4.67
Building Construction Worker Trips	1.42	0.88	18.70	0.00	0.30	0.30
Architectural Coating Offgassing	75.64	-	-	-	-	-
Architectural Coatings Worker Trips	1.42	0.88	18.70	0.00	0.30	0.30
Asphalt Offgassing	0.12	-	-	-	-	-
Asphalt Off-Road Diesel	2.41	15.09	19.91	-	0.52	0.46
Asphalt On-Road Diesel	0.02	0.43	0.08	0.00	0.01	0.01
Asphalt Worker Trips	0.01	0.01	0.13	0.00	0.00	0.00
Total	**103.24**	**160.48**	**239.72**	**0.00**	**6.38**	**5.74**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Adobe Falls – Upper Village						
Grading						
Fugitive Dust	-	-	-	-	26.20	5.50
Off-Road Diesel	13.47	83.36	113.07	-	3.00	2.67
Worker Trips	0.13	0.25	2.71	0.00	0.02	0.02
Total	**13.60**	**83.61**	**115.78**	**0.00**	**29.22**	**8.19**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Building Construction						
Building Construction Off-Road Diesel	7.47	47.99	61.11	-	1.76	1.57
Building Construction Worker Trips	0.34	0.21	4.47	0.00	0.07	0.07
Architectural Coating Offgassing	18.46	-	-	-	-	-
Architectural Coatings Worker Trips	0.34	0.21	4.47	0.00	0.07	0.07
Asphalt Offgassing	0.55	-	-	-	-	-
Asphalt Off-Road Diesel	4.00	23.39	33.99	-	0.68	0.61
Asphalt On-Road Diesel	0.10	1.96	0.38	0.00	0.04	0.04
Asphalt Worker Trips	0.02	0.01	0.27	0.00	0.00	0.00
Total	**31.28**	**73.77**	**104.69**	**0.00**	**2.62**	**2.36**

Table 3.2-8
Second Phase Construction Emissions with Mitigation

Construction Project/Phase	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
TOTAL SECOND PHASE[a]	**134.52**	**234.25**	**344.41**	**0.00**	**9.00**	**8.10**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Notes:
[a] Assuming simultaneous building construction phases.

Table 3.2-9
Remaining Projects - Construction Emissions with Mitigation

Construction Project/Phase	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Alvarado Campus						
Demolition						
Fugitive Dust	-	-	-	-	80.97	17.00
Off-Road Diesel	4.85	30.56	40.28	-	1.12	1.00
On-Road Diesel	10.97	202.27	40.65	0.50	5.64	5.58
Worker Trips	0.04	0.11	1.07	0.00	0.00	0.00
Total	**15.86**	**232.94**	**82.00**	**0.50**	**87.73**	**23.58**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Grading						
Fugitive Dust	-	-	-	-	11.55	2.43
Off-Road Diesel	9.83	59.51	82.83	-	0.21	0.21
Worker Trips	0.04	0.02	0.49	0.00	0.01	0.01
Total	**9.87**	**59.53**	**83.32**	**0.00**	**11.77**	**2.65**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Building Construction						
Building Construction Off-Road Diesel	18.67	115.98	155.70	-	4.07	3.62
Building Construction Worker Trips	0.90	0.57	12.11	0.00	0.21	0.21
Architectural Coating Offgassing	53.23	-	-	-	-	-
Architectural Coatings Worker Trips	0.90	0.57	12.11	0.00	0.21	0.21
Asphalt Offgassing	0.83	-	-	-	-	-
Asphalt Off-Road Diesel	10.36	60.85	87.80	-	1.76	1.57
Asphalt On-Road Diesel	0.14	2.62	0.53	0.01	0.06	0.01
Asphalt Worker Trips	0.04	0.03	0.56	0.00	0.01	0.01
Total	**85.07**	**180.62**	**256.70**	**0.01**	**6.32**	**5.63**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Table 3.2-9
Remaining Projects - Construction Emissions with Mitigation

Construction Project/Phase	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Adobe Falls – Lower Village						
Grading						
Fugitive Dust	-	-	-	-	119.99	25.20
Off-Road Diesel	13.47	81.28	113.77	-	2.71	2.41
Worker Trips	0.11	0.22	2.48	0.00	0.02	0.02
Total	**13.58**	**81.50**	**116.25**	**0.00**	**122.72**	**27.63**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**Yes**	**No**
Building Construction						
Building Construction Off-Road Diesel	7.47	46.39	62.28	-	1.63	1.45
Building Construction Worker Trips	0.31	0.19	4.12	0.00	0.07	0.07
Architectural Coating Offgassing	18.46	-	-	-	-	-
Architectural Coatings Worker Trips	0.31	0.19	4.12	0.00	0.07	0.07
Asphalt Offgassing	0.55	-	-	-	-	-
Asphalt Off-Road Diesel	4.00	23.19	33.99	-	0.64	0.57
Asphalt On-Road Diesel	0.09	1.72	0.35	0.00	0.04	0.04
Asphalt Worker Trips	0.02	0.01	0.25	0.00	0.00	0.00
Total	**31.21**	**71.69**	**105.11**	**0.00**	**2.45**	**2.20**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Student Housing – Phases 3 and 4						
Building Construction						
Building Construction Off-Road Diesel	22.27	138.39	185.70	-	4.86	4.33
Building Construction Worker Trips	3.50	6.88	76.69	0.05	0.44	0.44
Architectural Coating Offgassing	75.64	-	-	-	-	-
Architectural Coatings Worker Trips	1.29	0.81	17.21	0.00	0.30	0.30
Asphalt Offgassing	0.12	-	-	-	-	-
Asphalt Off-Road Diesel	2.41	14.71	20.19	-	0.49	0.44
Asphalt On-Road Diesel	0.02	0.37	0.08	0.00	0.01	0.01
Asphalt Worker Trips	0.01	0.01	0.12	0.00	0.00	0.00
Total	**105.26**	**161.17**	**299.99**	**0.05**	**6.10**	**5.52**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Table 3.2-9
Remaining Projects - Construction Emissions with Mitigation

Construction Project/Phase	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Conference Center						
Building Construction						
Building Construction Off-Road Diesel	5.31	32.32	44.51	-	1.07	0.06
Building Construction Worker Trips	0.28	0.55	6.17	0.00	0.03	0.03
Architectural Coating Offgassing	6.09	-	-	-	-	-
Architectural Coatings Worker Trips	0.28	0.55	6.17	0.00	0.03	0.03
Total	**11.96**	**33.42**	**56.85**	**0.00**	**1.13**	**0.12**
Significance Threshold	137	250	550	250	100	100
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Emissions from cut and fill during the grading phase of the Adobe Falls Lower Village construction were assumed to occur over a two-month period. Emissions could be lower should the duration of grading be longer than two months. Additionally, standard emission control measures to reduce fugitive dust would be employed, including watering active grading sites a minimum of three times daily, reducing speeds on unpaved surfaces to 15 mph or less, and reducing track-out of dirt onto paved surfaces. These measures would reduce emissions of fugitive dust, and were taken into account in the URBEMIS model to reduce emissions of fugitive dust. However, emissions would still have the potential to be above the significance threshold of 100 lbs/day. Therefore, construction-related emissions of fugitive dust (PM_{10}) associated with grading activities on the Adobe Falls Lower Village site would be significant and unavoidable.

3.2.5.2 Operational Impacts

This section addresses potential operational impacts resulting from criteria air pollutant emissions associated with the proposed project. Operational emissions, and the related potential air quality impacts, would result from three main source categories: area sources, stationary sources, and mobile sources. Emissions and potential impacts associated with each source category are described separately below.

3.2.5.2.1 Area Sources

Area sources of air pollutant emissions associated with implementation of the proposed project include:

- Fuel combustion emissions from energy use, including space and water heating;
- Fuel combustion emissions from landscape maintenance equipment; and
- Consumer product VOC emissions.

The URBEMIS2002 model, Version 8.7.0, was used to estimate incremental air pollutant emissions from each of the identified area source types. Land use data associated with the proposed project were used in the model to estimate square footage based on the proposed land uses, as described in section 3.2.5.1.1, Construction Phasing, above. The modeling analysis for the area sources used model default emission factors contained within the URBEMIS model.

Table 3.2-10, Summary of Estimated Operational Area Source Emissions, depicts the estimated emissions for the area sources. The URBEMIS output files are provided in EIR Appendix C, Air Quality Technical Report. As shown on Table 3.2-10, operational emissions associated with the area sources would not exceed the applicable significance thresholds.

Table 3.2-10
Summary of Estimated Operational Area Source Emissions

Emission Source	Maximum Daily Emissions (lbs/day)					
	ROG	**NOx**	**CO**	**SOx**	**PM_{10}**	**$PM_{2.5}$[1]**
Fuel Combustion	1.23	16.50	10.68	0.00	0.03	0.03
Landscaping	0.45	0.05	3.15	0.00	0.01	0.01
Consumer Products Use	69.77	-	-	-	-	-
Total	**71.45**	**16.55**	**13.83**	**0.00**	**0.04**	**0.04**
Significance Threshold (lbs/day)	***137***	***250***	***550***	***250***	***100***	***100***
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
	Annual Emissions (tons/year)					
	ROG	**NOx**	**CO**	**SOx**	**PM_{10}**	**$PM_{2.5}$[1]**
Fuel Combustion	0.23	3.01	1.95	0.00	0.01	0.01
Landscaping	0.04	0.00	0.28	0.00	0.00	0.00
Consumer Products Use	12.73	-	-	-	-	-
Total	**13.00**	**3.01**	**2.23**	**0.00**	**0.01**	**0.01**
Significance Threshold (tons/year)	***15***	***40***	***100***	***40***	***15***	***15***
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Notes:
[1]Based on SCAQMD guidelines, $PM_{2.5}$ is 99% of PM_{10} for combustion sources.

3.2.5.2.2 Stationary Sources

Stationary air pollutant emission sources on the SDSU Campus include the following:

- Central utilities cogeneration facility and steam plant boilers;
- Academic laboratory uses;
- Diesel-fueled emergency engines; and
- Maintenance operations (paint booth, gasoline service site, solvent use, *etc.*).

Criteria air pollutants generated from these sources include CO, VOCs, NOx, SOx, PM_{10}, and $PM_{2.5}$. Air pollutant emissions were estimated based on information provided by SDSU on the ratings of the boilers, and the usage of chemicals in laboratories on campus. Increased emissions associated with operation of the diesel emergency generators would be negligible as the engines would only be operated for testing purposes, and, therefore, emissions are not expected to increase substantially with the proposed increase in enrollment. Emissions from maintenance activities also are anticipated to remain relatively the same regardless of enrollment.

The San Diego APCD's 2005 Emissions Inventory Report (2005) provides estimates of emissions for the SDSU Campus based on estimated campus operations. The main emission source for the campus is the combustion of natural gas in the cogeneration facility. To account for increases in emissions from stationary sources associated with implementation of the proposed project, it was assumed that emissions would increase over existing emissions in proportion to the total square footage of increased building space. In 2005, the total developed square footage for the campus, including all indoor space, was 4,388,522 GSF. The project proposes to increase developed indoor space by a net amount of 2,067,207 GSF, an increase of 47.6 percent. This increase was assumed to increase emissions by 47.6 percent and, therefore, campus-wide stationary source emissions were assumed to increase by 47.6 percent.

Emissions from the use of laboratory chemicals in science classrooms are not included in the APCD's 2005 Emissions Inventory Report. Emissions associated with laboratory chemical usage are negligible, and enrollment increases are not expected to increase emissions from laboratory functions to a substantial level.

Table 3.2-11, Summary of Estimated Operational Stationary Source Emissions, depicts the projected increase in criteria pollutant emissions from stationary sources expected to result with implementation of the proposed project. As shown on **Table 3.2-11**, none of the stationary sources would result in increased emissions above the significance thresholds.

Table 3.2-11
Summary of Estimated Operational Stationary Source Emissions

Emission Source	Daily Emissions (lbs/day)[1]					
	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Existing Stationary Source Emissions	9.86	96.44	13.15	1.64	16.44	1.10
Buildout Stationary Source Emissions	14.55	142.35	19.41	2.42	24.27	1.62
Net Emissions Increase	4.69	45.91	6.26	0.78	7.83	0.52
Significance Threshold (lbs/day)	***137***	***250***	***550***	***250***	***100***	***100***
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
	Annual Emissions (tons/year)					
	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Existing Stationary Source Emissions	1.8	17.3	2.4	0.3	3.0	0.2
Buildout Stationary Source Emissions	2.66	25.54	3.54	0.44	4.43	0.30
Net Emissions Increase	0.86	8.24	1.14	0.14	1.43	0.10
Significance Threshold (tons/year)	***15***	***40***	***100***	***40***	***15***	***15***
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Notes:
[1]Based on 2005 Emissions Inventory Report, assuming annual emissions divided by 365 days per year, times a growth factor of 39.74 percent.

3.2.5.2.3 Vehicular Emissions

Implementation of the proposed project would result in an increase in vehicular traffic due to the increase in student enrollment. The projected increase in traffic attributable to the proposed project was calculated in the Traffic Impact Analysis – San Diego State University, prepared by Linscott, Law & Greenspan (May 2007).

Emissions associated with vehicular traffic were estimated using the URBEMIS2002 model. Inputs to the model include the incremental increase in vehicle trips, vehicle fleet percentage, winter and summer temperatures, trip characteristics, variable start information, emission factors, environmental factors, trip distances, and modeling year.

Table 3.2-12, Summary of Estimated Operational Vehicular Emissions, presents the vehicular emissions for each of the criteria pollutants that would be generated as a result of the increased vehicle traffic that would result with project implementation. As shown on **Table 3.2-12**, vehicular emissions associated with the proposed project would not exceed the applicable significance thresholds.

Table 3.2-12
Summary of Estimated Operational Vehicular Emissions

Emission Source	Maximum Daily Emissions (lbs/day)[1]					
	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$[2]
Vehicular Emissions	59.04	30.22	272.54	0.80	74.74	21.26
Significance Threshold (lbs/day)	***137***	***250***	***550***	***250***	***100***	***100***
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
	Annual Emissions (tons/year)					
	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$[2]
Vehicular Emissions	9.15	4.78	48.02	0.12	13.64	3.88
Significance Threshold (tons/year)	***15***	***40***	***100***	***40***	***15***	***15***
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Notes:

[1]Maximum daily emissions reported as the maximum of summer and winter day emissions from the URBEMIS model.
[2]Based on SCAQMD guidelines, $PM_{2.5}$ is 99% of PM_{10} for combustion sources and 21% for road dust.

3.2.5.2.4 CO Hot Spots Analysis

Projects involving increases in traffic and/or traffic congestion may result in localized increases in CO concentrations. To further evaluate whether the project would result in a significant impact, additional modeling was conducted to assess whether the increases in traffic attributable to the project would result in the formation of locally high concentrations of CO, known as CO "hot spots."

The Traffic Impact Analysis evaluated whether or not there would be a decrease in the level of service at the roadways and/or intersections affected by the project. The potential for CO "hot spots" was evaluated based on the results of the Traffic Impact Analysis. In accordance with the California Department of Transportation ("Caltrans") ITS Transportation Project-Level Carbon Monoxide Protocol (Caltrans 1998), CO "hot spots" are evaluated when (a) the level of service ("LOS") of an intersection or roadway decreases to a LOS E or worse; (b) signalization and/or channelization is added to an intersection; and (c) sensitive receptors such as residences, commercial developments, schools, hospitals, *etc.* are located in the vicinity of the affected intersection or roadway segment.

To evaluate the potential for CO "hot spots," CALINE4 modeling was conducted for the intersections identified in the Traffic Impact Analysis as significantly impacted by the proposed project under with and without Project traffic scenarios. The modeling was conducted to calculate maximum predicted 1-hour CO concentrations; predicted 1-hour CO concentrations were then scaled to evaluate maximum predicted 8-hour CO concentrations. Receptors were located at the subject intersections approximately 3 meters from the mixing zone, and at a height of 1.8 meters. Average approach and departure speeds were conservatively assumed to be 1 mph, and emission factors were estimated from the EMFAC2007 emissions model (ARB 2007) for 2012 near term conditions, and 2030 horizon year conditions.

In accordance with the Caltrans Protocol, future background CO concentrations also were estimated for near-term and horizon year conditions. Although CO concentrations in the future may be lower as inspection, maintenance programs, and more stringent emission controls are placed on vehicles, the existing maximum 1-hour and 8-hour background concentrations of CO were utilized to be conservative.

Table 3.2-13 and **Table 3.2-14** present a summary of the predicted CO concentrations for near-term and horizon year conditions, respectively. As shown on the tables, the predicted CO concentrations would be substantially below the 1-hour and 8-hour NAAQS and CAAQS. Therefore, because no exceedances of the CO standard are forecast, the project would not cause or contribute to a violation of the CO air quality standard, and no significant impacts would result. The CALINE4 model outputs are provided in EIR Appendix C.

Table 3.2-13
CO "Hot Spots" Evaluation - Near Term Conditions

Intersection	Near Term	
Maximum 1-hour Concentration Plus Background, ppm CAAQS = 20 ppm; NAAQS = 35 ppm; Background 5.3 ppm		
	am	***Pm***
College Avenue and Del Cerro Blvd.	6.7	N/A
College Avenue and I-8 Eastbound Ramps	6.9	N/A
College Avenue and Canyon Crest Drive	7.1	6.9
College Avenue and Montezuma Road	6.8	7.1
I-8 Westbound Ramps and Parkway Drive	N/A	5.8
Maximum 8-hour Concentration Plus Background, ppm CAAQS = 9.0 ppm; NAAQS = 9 ppm; Background 4.04 ppm		
College Avenue and Del Cerro Blvd.	5.02	
College Avenue and I-8 Eastbound Ramps	5.16	
College Avenue and Canyon Crest Drive	5.30	
College Avenue and Montezuma Road	5.30	
I-8 Westbound Ramps and Parkway Drive	4.39	

Table 3.2-14
CO "Hot Spots" Evaluation - Horizon Year Conditions

Intersection	Horizon Year	
Maximum 1-hour Concentration Plus Background, ppm CAAQS = 20 ppm; NAAQS = 35 ppm; Background 5.3 ppm		
	am	***pm***
Fairmount Avenue and I-8 Westbound Ramp	5.9	N/A
55th Street and Montezuma Road	5.7	5.7
Campanile Drive and Montezuma Road	5.6	5.7
College Avenue and Del Cerro Blvd.	5.8	5.8
College Avenue and I-8 Westbound Ramps	N/A	5.8
College Avenue and I-8 Eastbound Ramps	6.0	6.0
College Avenue and Zura Way	N/A	6.0
College Avenue and Montezuma Road	5.8	5.9
Alvarado Court and Alvarado Road	5.5	5.6
Reservoir Drive and Alvarado Road	N/A	5.5
Lake Murray Blvd. and Parkway Drive	5.7	5.7
70th Street and Alvarado Road	5.9	6.0
I-8 Westbound Ramps and Parkway Drive	5.4	5.5
I-8 Eastbound Ramps and Alvarado Road	5.6	5.8
Maximum 8-hour Concentration Plus Background, ppm CAAQS = 9.0 ppm; NAAQS = 9 ppm; Background 4.04 ppm		
Fairmount Avenue and I-8 Westbound Ramp	4.46	
55th Street and Montezuma Road	4.32	
Campanile Drive and Montezuma Road	4.32	
College Avenue and Del Cerro Blvd.	4.39	
College Avenue and I-8 Westbound Ramps	4.39	
College Avenue and I-8 Eastbound Ramps	4.53	
College Avenue and Zura Way	4.53	
College Avenue and Montezuma Road	4.46	
Alvarado Court and Alvarado Road	4.25	
Reservoir Drive and Alvarado Road	4.18	
Lake Murray Blvd. and Parkway Drive	4.32	
70th Street and Alvarado Road	4.53	
I-8 Westbound Ramps and Parkway Drive	4.18	
I-8 Eastbound Ramps and Alvarado Road	4.39	

3.2.5.2.5 Summary

Table 3.2-15, Summary of Total Estimated Operational Emissions, presents a summary of the total estimated operational air emissions associated with implementation of the proposed project, in comparison with the significance thresholds identified in section 3.2.4, Thresholds of Significance. To provide perspective regarding the significance of operational emissions, Table 3.2-15 also compares estimated project emissions with the ARB 2020 projections for the SDAB.

Table 3.2-15
Summary of Total Estimated Operational Emissions

Emission Source	Maximum Daily Emissions (lbs/day)					
	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Area Sources	71.45	16.55	13.83	0.00	0.04	0.04
Stationary Sources Emissions Increase	4.69	45.91	6.26	0.78	7.83	0.52
Vehicular Emissions	59.04	30.22	272.54	0.80	68.30	19.90
Total	**135.18**	**92.68**	**292.63**	**1.58**	**76.17**	**20.46**
Significance Threshold (lbs/day)	***137***	***250***	***550***	***250***	***100***	***100***
Above Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
	Annual Emissions (tons/year)					
	ROG	**NOx**	**CO**	**SOx**	**PM_{10}**	**$PM_{2.5}$**
Area Sources	13.00	3.01	2.23	0.00	0.01	0.01
Stationary Sources Emissions Increase	0.86	8.24	1.14	0.14	1.43	0.10
Vehicular Emissions	9.15	4.78	48.02	0.12	12.46	3.63
Total	**23.01**	**16.03**	**51.39**	**0.26**	**13.89**	**3.74**
Significance Threshold (tons/year)	***15***	***40***	***100***	***40***	***15***	***15***
Above Threshold?	**Yes**	**No**	**No**	**No**	**No**	**No**
Total (tons/day)	**0.068**	**0.046**	**0.146**	**0.00079**	**0.038**	**0.010**
Projected 2020 County Emissions (tons/day)	**543.77**	**171.25**	**159.37**	**31.59**	**135.77**	**47.89**

As shown in **Table 3.2-15**, maximum daily and annual emissions associated with implementation of the proposed project would be below the daily and annual significance thresholds for all pollutants except ROG. The main sources of these pollutants include the increased vehicular traffic and increased consumer products use generated by increased student enrollment at SDSU. Emissions of ROG can contribute to elevated levels of ozone in the ambient air because ROG react in the atmosphere to form ozone.

To develop its SIP and demonstrate that the air basin will attain and maintain the ozone standards, the San Diego APCD utilizes growth projections and traffic projections developed by SANDAG and local municipalities. Projects that are consistent with the SANDAG projections and with local General Plans are accounted for in the San Diego APCD's attainment demonstration, and would not contribute to a violation of the ozone standard. Should a project's projected growth in traffic exceed traffic projections developed by SANDAG and accounted for in the SIP and the attainment demonstration, the project may contribute elevated levels of ozone and may conflict with existing air quality plans.

The proposed project is consistent with the SANDAG growth projections for the county. Thus the operational emissions associated with implementation of the proposed project is not anticipated to adversely affect the air basin's ability to demonstrate continuing reductions and progress toward attainment of the ambient air quality standards.

As discussed in **Section 3.2.3.2**, Regulatory Setting, the San Diego APCD is in the process of preparing a new attainment plan that would develop plans and programs to attain and maintain the newly adopted 8-hour NAAQS for O_3. That process will include development of new emissions projections for future years. It is not anticipated that the emissions associated with implementation of the proposed project would contribute substantially to the overall emissions in the SDAB, and given that implementation of the proposed project is consistent with growth projections for the County, the project emissions will be accounted for in the attainment demonstrations contained in the updated SIP.

3.2.6 TOXIC AIR CONTAMINANT IMPACTS

As discussed in section 3.2.5.2.2, Stationary Sources, operations at SDSU include the combustion of natural gas in the campus cogeneration facility and campus boilers. Implementation of the proposed project will require additional natural gas usage with the increased enrollment. This section evaluates the increased emissions of toxic air contaminants ("TACs"), and the related health effects, that would result from the proposed project.

3.2.6.1 Toxic Air Contaminant Emission Estimates

As discussed in section 3.2.5.2, Operational Emissions, emissions of both criteria pollutants and TACs are attributable primarily to energy use on campus, with minor emissions attributable to maintenance and other support operations. The amount of increased TAC emissions attributable to the proposed project was estimated based on the 2005/2006 school year baseline, increased through project buildout in proportion to the future increases in campus building space. As discussed in section 3.2.5, under the proposed project indoor developed space would increase by 47.6 percent. Emissions of TACs for the 2005/2006 school year were obtained from the San Diego APCD's 2005 Emissions Inventory Report, which provides estimates of campus-wide TAC emissions.

Table 3.2-16, Estimated TAC Emission Increases, presents a summary of the TAC emissions, shown in pounds per year, for the year 2005/2006, and the projected increase in emissions by buildout year 2024/2025 attributable to the proposed project.

Table 3.2-16
Estimated TAC Emission Increases

TAC	Annual Emissions, lbs/year	
	2005/2006	Project Emissions 2024/2025
1,3-Butadiene	1.10	0.52
2,2,4-Trimethylpentane	1.38	0.66
Acetaldehyde	36.66	17.45
Acrolein	5.52	2.63
Benzene	11.79	5.61
Copper	0.01	0.005
Dichlorobenzene	0.01	0.005
Ethanol	22.85	10.88
Ethylbenzene	27.72	13.19
Formaldehyde	608.73	289.76
Hexane	18.73	8.92
Hydrogen Chloride	0.64	0.30
Lead	0.03	0.14
Manganese	0.01	0.005
Methanol	0.09	0.43
Methylene Chloride	16.47	7.84
Naphthalene	1.16	0.55
Nickel	0.01	0.005
PAHs	1.96	0.93
Perchloroethylene	40.23	19.15
Propylene	1.60	0.76
Toluene	114.61	54.55
Xylenes	55.73	26.53
Zinc	0.06	0.03

3.2.6.2 Health Risk Analysis

The HotSpots Analysis and Reporting Program ("HARP") (Office of Environmental Health Hazard Assessment ("OEHHA") 2003b) was used to estimate the incremental excess cancer risks associated with exposure to TACs attributable to the proposed project. The high-end excess cancer risk was calculated based on guidance from the OEHHA (2003a) using the 80th percentile exposure assumptions for inhalation risks (ARB 2003). Three categories of receptors were identified for the risk analysis. The first category of receptor is off-site residential receptors located outside the SDSU campus in residential areas surrounding the campus. For residential receptors, the risks were calculated based on 70 years of exposure for excess cancer risks and chronic non-cancer hazards, in accordance with OEHHA guidelines. The second category of receptors is on-site residential receptors (*i.e.*, student or faculty housing on campus). These receptors were assumed to inhabit the housing on a temporary basis; accordingly, the OEHHA 9-year adult residential scenario was used to calculate a worst-case excess cancer risk for on-site residential receptors. The receptors comprising the third category were placed in areas on campus to calculate risks based on an on-site worker exposure. In accordance with OEHHA guidelines, risks were based on 40 years of exposure for 8 hours per day, 250 days per year.

The HARP ISCST3 model was run to estimate ground-level concentrations of TACs. Surface and upper air meteorological data from the MCAS Miramar meteorological monitoring station (the nearest station to the project site) were used in the model. The HARP model provides estimates of health risks at receptors based on their exposure due to inhalation of TACs. The maximum risks for each of the three categories of receptors are summarized in **Table 3.2-17, Summary of Health Risk Analysis Results**.

Table 3.2-17
Summary of Health Risk Analysis Results

Receptor Category	Excess Cancer Risk	Chronic Hazard	Acute Hazard
Off-site Resident	0.0441 in a million	0.00106	0.261
On-site Student Resident	0.0171 in a million	0.000277	0.0662
On-site Worker	0.0254 in a million	0.000277	0.0662
Significance Thresholds	*10 in a million*	*1.0*	*1.0*

As shown in **Table 3.2-17**, the excess cancer risks and hazards for each of the three categories of receptors are below the significance thresholds. The risks due to exposure to the increased TAC emissions that would result with implementation of the proposed project, therefore, would be less than significant.

According to the ARB's *Air Quality and Land Use Handbook: A Community Perspective* (ARB 2005a), sensitive land uses should not be sited within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day. The Handbook guidelines, which are advisory only, are general recommendations and do not take into account site-specific factors, such as topography, wind direction and dispersion parameters, and traffic volumes on specific roadways. Based on a study of children living within 500 meters of a freeway (Gauderman *et al.* 2007), those children living within 500 meters of a freeway exhibited reduced lung-function development. The study identified several pollutants with elevated concentrations near freeways, including elemental carbon (an indicator for diesel particulate matter) and ultrafine particulate matter (also attributable to diesel exhaust). Diesel particulate matter has been identified by the ARB as a TAC, and has been identified in the ARB's *California Almanac of Emissions and Air Quality* (ARB 2005b) as a risk-driving chemical in the SDAB, contributing 69.2 percent of the basin-wide background excess cancer risk predicted by the ARB.

Diesel particulate emissions on freeways are associated mainly with diesel truck traffic. According to the SCAQMD's Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis (SCAQMD 2003), major sources of diesel particulate that would warrant a health risk assessment to address potential risks from diesel truck traffic and idling include transit centers, distribution centers and warehouses, and truck stops. Implementation of the proposed project would not be a major source of diesel particulate as it would neither generate nor attract a disproportionate amount of diesel truck trips. Thus, implementation of the proposed project would not contribute substantially to health effects to sensitive receptors within 500 feet of the freeway. Accordingly, diesel particulate emissions have not been addressed in this health risk assessment because implementation of the proposed project would not generate or attract substantial diesel truck trips.

3.2.7 GLOBAL CLIMATE CHANGE

Global climate change refers to the change in average climatic conditions on Earth as a whole, including temperature, wind patterns, precipitation, and storms. Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). These gases allow solar radiation (*i.e.*, sunlight) into the Earth's atmosphere, but prevent radiative heat from escaping, thus warming the Earth's atmosphere.[1]

Whether global climate change is attributable to anthropogenic emissions of greenhouse gases (mainly CO_2, CH_4, and N_2O) is currently an important and widely debated scientific, economic, and political issue in California and throughout the world. Historical records indicate that global climate changes have occurred in the past due to natural phenomena (such as during previous ice ages). Some data indicate that the current global conditions differ from past climate changes in rate and magnitude.

In a report issued in February 2007, the United Nations Intergovernmental Panel on Climate Change ("IPCC") stated that "global atmospheric concentrations of carbon dioxide, methane and

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1 California Environmental Protection Agency, *Climate Action Team Report to Governor Schwarzenegger and the Legislature* (March 2006), pages 6 and 22-39.

nitrous oxide have increased markedly as a result of human activities since 1750."[2] The IPCC also concluded, after disclosing a 10 percent margin of uncertainty, that the net effect of human activities has been global warming.[3] The IPCC constructed several emission trajectories of greenhouse gases needed to stabilize global temperatures and climate change impacts, and concluded that a stabilization of greenhouse gases at 400-450 parts per million ("ppm") CO_2-equivalent concentration is required to keep global mean warming below 2° Celsius, which is assumed to be necessary to avoid dangerous climate change (AEP 2007).

However, the causal relationship between human activities and global climate is not universally endorsed as the subject of scientific certainty. For instance, the U.S. Environmental Protection Agency ("EPA") noted that "a number of scientific analyses indicate, but cannot prove, that rising levels of greenhouse gases in the atmosphere are contributing to climate change."[4] Similarly, the National Research Council, a branch of the National Academies of Science, stated that "the mechanisms involved in land-atmosphere interactions are not well understood, let alone represented in climate change models."[5]

In spite of the scientific uncertainty and controversy that surrounds the relationship between human activities and global climate change, the following discussion addresses the general scientific basis underlying the global warming theory, surveys the regulatory setting in California, and quantifies approximate project emissions. Even though the project emissions are estimated, the proposed project's impact on climate change cannot be fully evaluated at this time due to the absence of regulatory guidance setting forth significance thresholds. Further, there is a very real likelihood that individual projects do not generate enough greenhouse gas emissions to significantly impact global climate change, but instead raise cumulative impact issues, which complicates the impact analysis.[6] Therefore, until further regulatory guidance is provided and the science of global climate change "settles," a full assessment of impacts is considered speculative at this time. Nonetheless, this EIR utilizes the best available information to disclose impacts associated with global climate change..

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2 Intergovernmental Panel on Climate Change, *Climate Change 2007: The Physical Science Basis - Summary for Policymakers* (February 5, 2007), page 2.

3 *Id.* at page 5.

4 *Available at* http://www.epa.gov/climatechange/science/stateofknowledge.html (*emphasis added*).

5 National Research Council of the National Academies, Climate Research Committee, *Radiative Forcing of Climate Change: Expanding the Concept and Addressing the Uncertainties* (2005), page 125.

6 Association of Environmental Professionals, *Alternative Approaches to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents* (April 27, 2007), page 1.

3.2.7.1 Greenhouse Gases

Greenhouse gases "trap" outgoing infrared radiation from the surface and lower atmosphere, resulting in the "greenhouse effect." Without the greenhouse effect, the Earth's temperature would be about 61°F cooler than it is now, and "life as we know it today would not be possible."[7] Greenhouse gases are emitted by natural processes and human activities, such as electricity production and vehicle operation. The accumulation of greenhouse gases in the atmosphere regulates the Earth's temperatures.

Each greenhouse gas has a varying global warming potential ("GWP"). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the "cumulative radiative forcing effect of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas" (EPA 2006). The reference gas for GWP is CO_2; therefore, CO_2 has a GWP of 1. The other main greenhouse gases that have been attributed to human activity include CH_4, which has a GWP of 21, and N_2O, which has a GWP of 310.

Anthropogenic sources of CO_2 include fossil fuel combustion (*e.g.*, coal, oil, natural gas, gasoline, and wood). Concentrations of CO_2 have increased in the atmosphere since the industrial revolution from approximately 280 ppm in 1750 to approximately 383 ppm in 2007, an increase of 103 ppm. Data from ice cores indicates that CO_2 concentrations remained steady prior to the current period for approximately 10,000 years. Data from Mauna Loa Observatory on Hawaii indicate that CO_2 concentrations in the atmosphere have increased from 315 ppm in 1960 to 383 ppm in 2007 (ESRL 2007).

CH_4 is the main component of natural gas, and also arises naturally from anaerobic decay of organic matter. Anthropogenic sources of natural gas include landfills, fermentation of manure, and cattle farming. N_2O is a colorless greenhouse gas. Anthropogenic sources of N_2O include combustion of fossil fuels and industrial processes such as the production of nylon and nitric acid.

Other greenhouse gases are present in trace amounts in the atmosphere, and include chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and ozone.

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7 *Available at* http://www/epa.gov/climatechange/science/index.html.

3.2.7.2 Greenhouse Gas Inventory

In 2004, total greenhouse gas emissions worldwide were estimated at 20,135 metric tons of CO_2 equivalents (UNFCCC 2006). The United States contributed the largest portion of greenhouse gas emissions at 35 percent of global emissions. In California, according to the California Energy Commission (CEC 2006), CO_2 accounts for approximately 84 percent of statewide greenhouse gas emissions, with CH_4 accounting for approximately 5.7 percent of greenhouse gas emissions and N_2O accounting for another 6.8 percent of greenhouse gas emissions. Other pollutants account for approximately 2.9 percent of greenhouse gas emissions in California. The transportation sector is the single largest category of California's greenhouse gas emissions, accounting for 41 percent of emissions statewide. In 2004, California produced 492 million metric tons of total CO_2-equivalent emissions.

3.2.7.3 Regulatory Background

Federal. In April 2007, the U.S. Supreme Court ruled that the U.S. EPA should regulate carbon dioxide and other greenhouse gases emitted by motor vehicles as pollutants under the federal Clean Air Act unless it determines that these gases do not contribute to global climate change or articulates some other reasonable explanation for why it will not exercise its discretion. (*Massachusetts v. Environmental Protection Agency* (2007) 127 S.Ct. 1438, 1462.) The EPA has not developed a regulatory program for greenhouse gas at this time.

State. On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05 ("EO S-3-05"), which set forth the following greenhouse gas emission reduction targets for the State of California:

- By 2010, greenhouse gas emissions must be reduced to 2000 levels.
- By 2020, greenhouse gas emissions must be reduced to 1990 levesl.
- By 2050, greenhouse gas emissions must be reduced to 80% below 1990 levels.

In the fall of 2006, Governor Schwarzenegger signed into law California Assembly Bill 32 ("AB 32"), the Global Warming Solutions Act of 2006.[8] This legislation does not amend CEQA, but provides a vehicle by which the mandate of EO S-3-05 can be achieved. As such, AB 32 requires: (i) the reporting and verification of greenhouse gas emissions; (ii) the adoption of a statewide plan directed towards the reduction of greenhouse gases by the California Air Resources Board ("CARB"); and (iii) the quantification, implementation, and enforcement of greenhouse gas emissions limits by CARB.

8 AB 32 is codified at Health and Safety Code section 38500 *et seq.*

Implementation of AB 32 is scheduled to occur gradually. CARB must identify significant sources of greenhouse gas emissions and adopt regulations to require the reporting and verification of greenhouse gas emissions by January 1, 2008. By the following year, January 1, 2009, CARB is required to have approved and adopted a scoping plan addressing how California may feasibly reduce its emissions. However, it is not until January 1, 2012 that CARB must enforce rules and caps for greenhouse gas emission sources. Thus, at this time, AB 32 has not resulted in the regulation of greenhouse gas emissions or identified thresholds of significance that may be utilized in evaluating impacts of a proposed project.

3.2.7.4 Determination of Significance

Neither CEQA nor the CEQA Guidelines provide guidance in determining whether a project's impacts relative to global climate change would be significant. As noted above, AB 32 requires that CARB approve and enforce rules and gaps for sources of greenhouse gas emissions by 2012. This work may provide direction to establish CEQA guidelines for the determination of significance, but that guidance is not available at the present time. Therefore, the information presented in this section is provided for information purposes only; no determination of impact significance can be made because no thresholds of significance have been established under CEQA or any other relevant law.

3.2.7.5 Scope of Greenhouse Gas Emissions

The Greenhouse Gas Protocol Initiative ("Protocol"), the most widely used international accounting tool for the management of greenhouse gas emissions, is a decade-long partnership between the World Resources Institute and the World Business Council for Sustainable Development. The Protocol is working with businesses, governments, and environmental groups around the world to build a new generation of credible and effective programs for tackling global climate change.

The Protocol provides the accounting framework for nearly every greenhouse gas standard in the world, and divides greenhouse gas emissions into three scopes, ranging from greenhouse gases produced directly by the project, to more indirect sources of greenhouse gas emissions, such as employee travel and commuting:

Scope 1: All direct greenhouse gas emissions;

Scope 2: Indirect greenhouse gas emissions from consumption of purchased electricity, heat, or steam; and

Scope 3: Other indirect emissions, including emissions from the extraction and production of purchased materials and fuels, transportation-related activities in vehicles not owned or controlled by the project, electricity-related activities (for example, transmission and distribution losses) not covered in Scope 2, and outsourced activities such as waste disposal, *etc*.

For purposes of this analysis, greenhouse gas emissions under the operational control of SDSU and associated with the proposed project have been identified and quantified. These emissions include the direct increase in emissions associated with increased fossil fuel combustion at the SDSU cogeneration facility to provide power for expanded campus installations, and indirect emissions associated with the increase in campus enrollment.

3.2.7.6 Project Emissions

Current sources of greenhouse gas emissions at SDSU are mainly attributable to the combustion of fossil fuels, including emissions from stationary sources such as the cogeneration plant and boilers, emergency generators, and emissions from motor vehicles.

Greenhouse gas emissions associated with the proposed project were estimated for the following four categories of emissions sources: (1) campus stationary source fossil fuel combustion to provide power; (2) residential development; (3) water consumption; and (4) transportation. Each category is addressed separately below.

3.2.7.6.1 Stationary Source Greenhouse Gas Emissions

The main source of campus greenhouse gas emissions would be from the combustion of natural gas to power the cogeneration facility. The San Diego APCD's 2005 Emissions Inventory Report does not provide estimates of greenhouse gas emissions for the SDSU campus. However, SDSU reports that for the 2005-2006 academic year, the amount of natural gas combusted at the campus was 8,783,813 therms, or 878,381 MMBTU. To estimate the future increase in stationary source emissions attributable to the proposed increase in student enrollment, energy use was assumed to increase from 2005 levels in proportion to the increase in total full-time equivalent students ("FTES"). Under the proposed project, the FTES enrollment would increase by 10,000 between now and 2024/25. A 10,000 FTES increase from the existing 2005/2006 enrollment of 25,163 FTES would result in an increase in 39.74 percent and, consequently, an increase in emissions of 39.74 percent. Thus, natural gas consumption is estimated to increase by 349,069 MMBTU to 1,227,450 MMBTU with implementation of the proposed project.

This increase in MMBTU was converted to greenhouse gas emissions based on emission factors provided in the EPA's *Compilation of Air Pollutant Emission Factors*, Section 3.1, Stationary Gas Turbines (EPA 2000), which provides emission factors of 110 lbs/MMBTU for CO_2, 0.003 lbs/MMBTU for N_2O, and 0.0086 lbs/MMBTU for CH_4. Applying these factors to the increase in MMBTU, the increase in emissions of greenhouse gases associated with stationary source natural gas usage were calculated and are summarized in **Table 3.2-18, Summary of Estimated Operational Stationary Source Greenhouse Gas Emissions**. As discussed above in section 3.2.7.1, Greenhouse Gases, emissions of N_2O and CH_4 were evaluated based on their relative GWP by multiplying the GWP by the emissions to determine the CO_2-equivalent emissions. The total CO_2-equivalent emissions for stationary sources is the sum of the CO_2-equivalent emissions for each of the greenhouse gases evaluated, and the total is shown in Table 3.2-18.

Table 3.2-18
Summary of Estimated Operational Stationary Source Greenhouse Gas Emissions

Emission Source	Annual Emissions (tons/year)		
	CO_2	N_2O	CH_4
SDSU Stationary Sources	19,199	0.523	1.50
Global Warming Potential Factor	1	310	21
CO_2 Equivalent Emissions	19,199	162	31.5
Total CO_2 Equivalent Emissions	19,393		

Thus, estimated stationary source emission increases associated with the proposed project would total approximately 19,393 tons of CO_2-equivalent greenhouse gases.

3.2.7.6.2 Residential Greenhouse Gas Emissions

The proposed project includes the development of up to 348 condominium/townhouse units on the Adobe Falls site. Residences were assumed to use purchased electricity for cooling, appliance, and plug-loads, and use natural gas for cooking and water heating. Baseline energy use was calculated as a function of kWh per square foot based on average performance for Southern California residences compliant with Title 24 (2005) standards. According to the California Energy Commission (CEC 2004), the average annual residential energy usage rate, in kilowatt-hours (kWh), would be 5,914 kWh per residential unit. According to EPA, the national average emission factor for CO_2 from electricity use is 1.37 pounds CO_2 per kWh.

Applying the EPA emission factor for CO_2 to the annual residential energy use rate, the proposed Faculty Staff Housing component of the project is estimated to generate approximately 8,102 pounds (or 4.05 tons) of CO_2 per year per household. Multiplying 4.05 tons by 348 housing units, the proposed Adobe Falls Faculty/Staff Housing is estimated to generate approximately 1,409 tons per year of CO_2.

3.2.7.6.3 Water Consumption

Water use and energy use are often closely linked. The provision of potable water to commercial and residential consumers requires large amounts of energy associated with five stages: source and conveyance, treatment, distribution, end use, and wastewater treatment.

It is estimated that the proposed project student enrollment increase would result in an increase in water usage of 161 acre-feet per year ("afy"), the increased population at Adobe Falls would result in water usage of 146 afy, and the hotel would result in water usage of 40 afy, for a total increase in water usage of approximately 350 afy. (See, EIR Section 3.13, *Public Utilities and Service Systems.*) 350 afy is equivalent to 114.0 million gallons of water usage annually. It is estimated that delivered water will have an embodied energy of 0.0085 kWh/gallon. And, as noted above, the EPA national average emission factor for CO_2 from electricity use is 1.37 pounds CO_2 per kWh. Therefore, to calculate CO_2 emissions associated with future water consumption, 114.0 million gallons of water was multiplied by the energy usage rate of 0.0085 kWh/gallon, with the resulting number multiplied by the 1.37 pounds CO_2 per kWh, for a total of an estimated 664 tons per year of CO_2 emissions associated with water consumption.

3.2.7.6.4 Vehicle Greenhouse Gas Emissions

Vehicle greenhouse gas emissions were estimated based on the projected increase in average daily trips that would result from the proposed project. (Traffic Impact Analysis, LLG May 2007; EIR Appendix C). Average trip lengths were estimated based on the URBEMIS2002 model outputs, which indicated that the average trip length associated with the proposed project would be 7.475 miles. The total miles traveled was multiplied by average fleet fuel economy (assumed to be 21 miles per gallon for 2007), and the estimated CO_2 emissions per gallon of gasoline, assumed to be 19.4 lbs CO_2 per gallon (EPA 2007). Assuming the increased vehicle trips would occur over a 250-day period (to account for periods when classes are not in session, weekends, and holidays), the total CO_2 emissions attributable to the project's increase in vehicle trips were estimated to be 10,776 tons per year.

3.2.7.7 Summary

As shown on **Table 3.2-19, Summary of Estimated Operational Greenhouse Gas Emissions,** the proposed project would generate approximately 32,677 tons per year of CO_2 equivalent emissions at project buildout year 2024/25. These increased greenhouse gas emissions would result from the combustion of fossil fuels, purchased electricity, water usage, and vehicular emissions associated with the proposed project, and were estimated based on standard methodologies.

Table 3.2-19
Summary of Estimated Operational Greenhouse Gas Emissions

Emission Source	Annual Emissions (tons/year)		
	CO_2	N_2O	CH_4
Stationary Source CO_2 Equivalent Emissions	19,199	162	31.5
Residential CO_2 Emissions	1,499		
Water Usage CO_2 Emissions	664		
Vehicular CO_2 Emissions	10,776		
TOTAL CO_2 Equivalent Emissions	**32,677**		

A forecast of the total amount of greenhouse gas emissions for the SDAB or California is not available currently. And, as noted above, because CEQA does not contain thresholds of significance relative to greenhouse gas emissions, conclusions cannot be made at this time regarding the significance of impacts associated with greenhouse gas emissions from the proposed project. Nonetheless, in an effort to respond to the proposed project's greenhouse gas emissions, several project design features are included to offset the production and/or release of greenhouse gases:[9]

- The proposed project components will rely on energy efficient appliances (*i.e.,* washers/dryers; refrigerators; stoves; *etc.*) as identified by the California Energy Commission pursuant to Public Resources Code Section 25402;
- The facilities associated with each proposed project component will include locations for separate waste and recycling receptacles;
- The landscaping at each project component will incorporate the addition of trees in order to: (i) insulate structures from weather, thereby decreasing energy requirements; and (ii) facilitate carbon sequestration;

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9 These project design features are based on the suggestions made in the California Climate Action Team's March 2006 report to Government Schwarzenegger, which is available at www.climatechange. ca.gov/climate_action_team/reports/index.html.

- The proposed project components will conserve water usage to the maximum extent practicable, including the use of low flow appliances, automatic shut off valves for sinks in restrooms, drought resistant landscaping, and controlled sprinkler systems;
- In order to encourage the use of intelligent transportation systems, information regarding the San Diego Trolley will be provided to all incoming and returning students; and
- High-speed internet access will be available throughout the campus to encourage telecommuting and other online uses (*e.g.*, online shopping).

It is also noted that the California State University ("CSU") has adopted a revised policy on energy conservation and utilities management, which requires that all CSU campuses take every necessary step to conserve water resources, including installing controls to optimize irrigation water, reducing water usage in restrooms and showers, and cooperating with state, city and county governments to the greatest extent possible to effect additional water conservation.

Consistent with CSU policy, SDSU has installed low-flow toilets and urinals, flush valve controls, electronic faucets and low-flow showerheads in all or most of its lavatory facilities. SDSU also has required the installation of energy and water conserving fixtures in all new construction on campus. To conserve water used in landscape irrigation, SDSU utilizes irrigation controllers that are linked to weather service evapotranspiration data to deliver the irrigation water only when needed. As a result of these measures, SDSU's water consumption has remained relatively constant from 1989 to the present, despite increased campus population, the addition of approximately 2 million square feet of new buildings and structures, and improvements to campus landscaped areas (William Lekas, SDSU, pers. comm.). Consistent with CSU policy, SDSU will continue to implement conservation measures to reduce the use of water and decrease wastewater flows.

Moreover, SDSU already implemented an aggressive energy efficiency program throughout the campus. This program will further help reduce energy use in new buildings and facilities that are part of the proposed project. By way of example, the recently completed Arts and Letters Building implemented all of SDSU's new efficiency measures, and exceeded Title 24 energy requirements by approximately 25%. Therefore, as new facilities, such as those proposed by the project, come online, energy efficiencies will be realized immediately due to the efficient infrastructure programs and systems already in place at SDSU, as well as future energy efficiency mandates that will be incorporated into all future building design. These past and future energy conservation efforts by all SDSU programs and facilities will help offset future energy use and demand.

3.2.8 CUMULATIVE IMPACTS

3.2.8.1 Construction and Operational

During project construction, unrelated off-campus projects also could be under construction simultaneous with SDSU construction activities. While it is unlikely that other projects constructed in the vicinity of the SDSU campus would contribute to localized impacts from fugitive dust emissions, because emissions of PM_{10} would be above the significance threshold for the grading phase of the Adobe Falls Lower Village project component, both direct and cumulative impacts from fugitive dust emissions during project construction would result in a significant, but temporary, impact on ambient air quality.

Construction-related emissions of ozone precursors (NOx and ROG) would not result in significant cumulative impacts to air quality because the impacts would be short-term and temporary in nature, they would represent a small percentage of the emissions of ozone precursors in the SDAB and would not be cumulatively considerable, and the project's emissions can be mitigated to below a level of significance.

Operational emissions were evaluated in terms of the potential for impacts based on quantitative emission thresholds established by the City of San Diego. As discussed in section 3.2.5.2.5, Summary, emissions of ROG would be above the quantitative significance thresholds. To address whether the proposed project would have a cumulative impact on air quality, the project's consistency with SANDAG growth projections was evaluated. SANDAG's growth projections provide the basis for emissions estimates that are developed for the attainment demonstration and SIP requirements adopted by the San Diego APCD. If a project is consistent with overall growth projections for the County, the project would fit within the emissions estimates used to demonstrate that the SDAB will attain and maintain the ozone standard. As discussed above, the proposed project would not adversely affect the air basin's ability to demonstrate continuing reductions and progress toward attainment of the ambient air quality standards. Furthermore, the proposed project's emissions represent a small percentage of the projected 2020 emissions budget for the SDAB. Therefore, implementation of the proposed project would not result in a significant cumulative impact.

3.2.8.2 CO Hot Spots

The potential for localized CO "hot spots" was evaluated based on the traffic movements for the near term and horizon year cumulative conditions. These traffic projections include not only project-specific traffic, but also traffic associated with baseline conditions and cumulative projects. Accordingly, the evaluation of the potential for CO "hot spots" is based on a cumulative analysis and indicates that the SDSU Campus Master Plan would not result in significant cumulative CO "hot spots" impacts.

3.2.8.3 Health Risk Assessment

Based on the ARB's *California Almanac of Emissions and Air Quality* (ARB 2005b), background excess cancer risks in the SDAB were estimated at 607 in a million in the year 2000. No estimate of background chronic hazards or acute hazards was provided in the Almanac. The main contributors to background excess cancer risks were identified as diesel particulate, benzene, 1,3-butadiene, and carbon tetrachloride. While the background risks are above the significance threshold of 10 in a million for excess cancer risks, the contribution to the overall excess cancer risk from the proposed project would be 0.0441 in a million, or 0.0073 percent of the background risk. Additionally, as discussed above, the proposed project would not be a major source of diesel particulate emissions nor would it attract a disproportionate number of truck trips. For these reasons, the proposed project's contribution of TAC to the overall excess cancer risk in the SDAB would not be cumulatively considerable and would not result in significant cumulative air quality impacts.

3.2.9 MITIGATION MEASURES

3.2.9.1 Construction-Related Emissions

As discussed above, short-term construction activities during grading may result in an exceedance of the recommended PM_{10} significance thresholds, depending upon the amount of acreage disturbed, and the amount of equipment operating at any one time. Additionally, daily emissions of ROG may exceed the daily threshold during the application of paints and coatings if the entire project were to be painted in a brief period of time. Therefore, the following mitigation measure is proposed to reduce potential short-term construction-related impacts to a level below significant:

> **AQ-1** Prior to the commencement of construction activities on each of the project component sites, SDSU, or its designee, shall require, to the extent feasible, that the principal construction contractor develop a construction activity impact mitigation plan.

The elements of such a plan, to be approved by SDSU, or its designee, and implemented and supervised by the managing contractor, shall include:

1. During grading activities, any exposed soil areas shall be watered twice per day. On windy days or when fugitive dust can be observed leaving the project site, additional applications of water shall be applied to maintain a minimum 12 percent moisture content. Under windy conditions where velocities are forecast to exceed 25 miles per hour, all ground disturbing activities shall be halted until the winds are forecast to abate below this threshold.

2. The contractor shall implement dust suppression techniques to prevent fugitive dust from creating a nuisance offsite. These dust suppression techniques shall include the following:

    a. Portions of the construction site to remain inactive longer than a period of three months shall be seeded and watered until grass cover is grown or otherwise stabilized.

    b. All on-site access points shall be paved as soon as feasible or watered periodically or chemically stabilized.

    c. All material transported offsite shall be either sufficiently watered or securely covered to prevent excessive amounts of dust.

    d. The area disturbed by clearing, grading, earthmoving, or excavation operations shall be minimized at all times. A maximum daily grading disturbance area shall be maintained at 8.7 acres or less, if possible and practical.

3. All vehicles on the construction site shall travel at speeds less than 15 miles per hour.

4. All material stockpiles subject to wind erosion during construction activities that will not be utilized within three days, shall be covered with plastic, an alternative cover deemed equivalent to plastic, or sprayed with a nontoxic chemical stabilizer.

5. Where vehicles leave the construction site and enter adjacent public streets, the streets shall be swept daily or washed down at the end of the work day to remove soil tracked onto the paved surface. Any visible track-out extending for more than fifty (50) feet from the access point shall be swept or washed within thirty (30) minutes of deposition.

6. All diesel-powered vehicles and equipment utilized during construction activities shall be properly operated and maintained.

7. All diesel-powered vehicles and gasoline-powered equipment shall be turned off when not in use for more than five (5) minutes.

8. The construction contractor shall utilize electric or natural gas-powered equipment *in lieu* of gasoline or diesel-powered engines, where feasible.

9. The construction contractor, as much as possible, shall time the construction activities so as not to interfere with peak hour traffic. In order to minimize obstruction of through traffic lanes adjacent to the site, a flagperson shall be retained to maintain safety adjacent to existing roadways, if necessary.

10. The construction contractor shall support and encourage ridesharing and transit incentives for the construction crew.

11. The construction contractor shall utilize as much as possible pre-coated/natural colored building materials. Water-based or low volatile organic compounds ("VOC") coatings with a reactive organic gases ("ROG") content of 100 grams per liter or less shall be used. Spray equipment with high transfer efficiency, such as the electrostatic spray gun method, or manual coatings application such as paint brush hand roller, trowel, spatula, dauber, rag, or sponge, shall be used to reduce VOC emissions, where practical.

12. If construction equipment powered by alternative fuel sources (LPG/CNG) is available at comparable cost, the construction contractor shall specify that such equipment be used during all construction activities on the project site.

13. The construction contractor shall require the use of particulate filters on diesel construction equipment if the use of such filters is demonstrated to be cost-competitive for use on this project.

14. During demolition activities, the construction contractor shall utilize safety measures relating to the removal of hazardous and/or toxic materials as required by the SDSU Environmental Health and Safety Department, in accordance with all applicable state and federal laws.

15. The construction contractor shall maintain rubble piles in a damp state during demolition to minimize dust generation.

3.2.9.2 Operation-Related Emissions

As discussed above, operational emissions attributable to the increased number of on-campus residents (increased consumer products use), and the increased number of vehicle trips (increase in student enrollment), will exceed the significance thresholds for reactive organic gases ("ROG"). There are no feasible mitigation measures that could reduce the project emissions to a level below significant. However it is recommended that all available transportation control measures ("TCMs") be implemented, as contained in the following mitigation measure, to reduce any/all identified significant impacts where feasible.

AQ-2 To the extent SDSU has not previously implemented the following transportation control measures, as soon as reasonably feasible, SDSU, or its designee shall:

(a) Provide preferential parking spaces for employee carpools and vanpools;

(b) Provide on-street bus shelters and well-lighted, safe paths between site uses;

(c) Schedule truck deliveries and pickups for off-peak hours where feasible;

(d) Work with the City of San Diego to implement or contribute to public outreach programs that promote alternative methods of transportation; and

(e) Require that delivery trucks turn off their engines if the anticipated duration of idling exceeds three (3) minutes.

The TCMs included in mitigation measure AQ-2 have a range of emission reduction effectiveness depending upon how successfully they are implemented. Attainment of the high end of this range requires a number of favorable factors such as larger employers, with fixed work schedules and low-paid jobs, mixed site uses, and existing transit access that allows for attainment of enhanced efficiencies. Not all of these factors apply to SDSU and the proposed project and, therefore, reductions of project-related impacts achieved under mitigation measure AQ-2 may be limited in scope.

3.2.10 LEVEL OF SIGNIFICANCE AFTER MITIGATION

With implementation of the proposed mitigation measures, the potentially significant short-term impacts to air quality associated with construction activities would be reduced to a level below significant. However, because there are no feasible mitigation measures to reduce the potential air quality impacts attributable to the proposed project increased consumer products use and vehicle trips, long-term air quality impacts attributable to project operation would be significant and unavoidable.