Grantville Focused Plan Amendment
San Diego, California

AIR QUALITY and GREENHOUSE GAS STUDY

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AIR QUALITY and GREENHOUSE GAS STUDY

This report is an analysis of the potential air quality and greenhouse gas impacts associated with the proposed Grantville Focused Plan Amendment in the City of San Diego. The report has been prepared by Rincon Consultants, Inc. under contract to BRG Consultants, Inc. to support preparation of the environmental documentation pursuant to the California Environmental Quality Act (CEQA). This study analyzes the potential for temporary impacts associated with construction and long-term impacts associated with the operation of development associated with the Focused Plan Amendment. The analysis herein is based partially on the traffic trip generation memorandum prepared by Linscott, Law and Greenspan, Inc. (January, 2014).

PROJECT DESCRIPTION

The project location, referred to as "Subarea A," is within the former Grantville Redevelopment Project Area, within the eastern portion of the City of San Diego, in San Diego County. Subarea A is a 379-acre area comprised of commercial, office, industrial, public facility, park and open space uses located immediately north of Interstate 8 along both sides of Fairmount Avenue, Friars Road and Mission Gorge Road north to Zion Avenue (and including several parcels north of Zion Avenue). The southeast portion of Subarea A includes the first seven parcels on the southern side of Adobe Falls Road (starting at Waring Road) (see Figure 1). Proposed land use designations and related uses within Subarea A were formerly addressed in an EIR prepared for the Grantville Redevelopment Project (March 2005, SCH #2004071122).

The Grantville Focused Plan Amendment ("Amendment") consists of three components: (1) an amendment to the Navajo Community Plan, (2) processing of proposed rezones, and (3) an update to the Navajo Facilities Finance Plan. The Amendment and rezones would introduce residential and mixed-use development to the Grantville neighborhood which is currently comprised of predominately industrial and commercial uses.

The proposed Focused Plan Amendment, referred to as Alternative D, would result in a net increase of approximately 8,275 residential dwelling units over what is allowed by the existing community plan (based on land use assumptions in the LLG traffic study). The Amendment to the Navajo Community Plan will define the long-range vision and comprehensive policy framework for how Subarea A could develop over the next 20 to 30 years and will provide policy direction for future development guided by the City of Villages growth strategy and citywide policy direction contained within the City of San Diego General Plan (2008).

The proposed Amendment would rezone Subarea A from predominately single-use commercial and industrial zones to multiple-use zones that promote transit-oriented development. Alternative D would be implemented through the adoption of three new zones: 1) CC-3-6, a community commercial zone which will emphasize pedestrian orientation and allow up to 44 dwelling units per acre, 2) CC-3-8, a community commercial zone which will emphasize pedestrian orientation and allow up to 73 dwelling units per acre, 3) RM-3-7, a multiple

Figure 1 – Focused Plan Amendment Location

dwelling unit residential zone which will allow for limited commercial uses and allow up to 44 dwelling units per acre. The proposed zoning designations along with the adoption of a new Community Plan Implementation Overlay Zone (CPIOZ) will provide the tools needed to achieve the proposed land use amendments associated with Alternative D. The proposed CPIOZ, referred to as the "Grantville Transit Oriented Development (TOD) CPIOZ", will promote mixed-use, TOD with pedestrian and bicycle orientation and allow increased density (up to 109 dwelling units per acre) in the area surrounding the Grantville Light Rail Trolley Station when certain criteria are met. This report provides a program level evaluation of potential impacts related to air quality and greenhouse gas emissions associated with implementation of Alternative D.

AIR QUALITY ANALYSIS

This report analyzes both temporary air quality impacts relating to construction activity and possible long-term air quality impacts associated with development of Subarea A in accordance with the Focused Plan Amendment. The analysis herein is based partially on the traffic trip generation memorandum prepared by Linscott, Law and Greenspan, Inc. (January, 2014).

SETTING

Current Air Quality

The project area, Subarea A, is located within the San Diego County Air Pollution Control District (SDCAPCD) which includes 11 monitoring stations throughout the District. The distinctive climate of the San Diego Air Basin ("Basin") is determined by its terrain and geographical location. The Basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean on the western quadrant with mountains and canyon forming the eastern boundary. The climate of the SDCAPCD is strongly influence by its proximity to the Pacific Ocean and the location of the semi-permanent high-pressure cells in the northeastern Pacific. With a Mediterranean-type climate, San Diego is characterized by warm, dry summers and cool winters with occasional rainy periods.

The seasonal rainfall is about 10 inches in the City of San Diego, but increases with elevation and distance from the cost. In the mountains to the north and east the average is between 20 and 40 inches, depending on slope and elevation. Most of the precipitation falls in winter, except in the mountains where there is an occasional thunderstorm. Eighty-five percent of the rainfall occurs from November through March, but wide variations take place in monthly and seasonal totals.

Due to the large size and topography within the SDAPCD there is a wide variation in temperature within short distances. The moderating effect of the ocean regulates the coastal temperature to range of 58 °F to 71 °F near the coast. In nearby valleys daytime temperatures are much warmer in summer and nights are noticeably cooler in the winter.

The dominant daily wind patter for the Basin is westerly daytime sea breeze and an easterly nighttime land breeze. Generally, wind speed averages are about 25% higher in spring and summer than in fall and winter, with an average wind speed of about 7.0 miles per hours at the coast and slightly lower in the inland mountains. This regime is broken by occasional winter storms and infrequent strong, northeasterly "Santa Ana" winds from the mountains and deserts northeast of the Basin. "Santa Ana" winds are typically hot, dry northerly winds which blow offshore at 15-20 mph, but can reach speed over 60 mph.

Two types of temperature inversions (warmer air on top of cooler air) are created in the area: subsidence and radiational. The subsidence inversion is a regional effect created by the Pacific high in which air is heated as it is compressed when it flows from the high-pressure area to the low pressure areas inland. This type of inversion generally forms at about 1,000 to 2,000 feet and can occur throughout the year, but it is most evident during the summer months. Surface inversions are formed by the more rapid cooling of air near the ground during the night, especially during winter. This type of inversion is typically lower and is generally accompanied

by stable air. Both types of inversions limit the dispersal of air pollutants within the regional air shed, with the more stable the air (low wind speeds, uniform temperatures), the lower the amount of pollutant dispersion.

Air Pollution Regulation

The federal and state governments have been empowered by the federal and state Clean Air Acts to regulate the emission of airborne pollutants and have established ambient air quality standards for the protection of public health. The United States Environmental Protection Agency (USEPA) is the federal agency designated to administer air quality regulation, while the Air Resources Board (ARB) is the state equivalent in the California Environmental Protection Agency. Local control in air quality management is provided by the ARB through multi-county and county-level Air Pollution Control Districts (APCDs). The ARB establishes statewide air quality standards and is responsible for the control of mobile emission sources, while the local APCDs are responsible for enforcing standards and regulating stationary sources. The ARB has established 15 air basins statewide. As described above the City of San Diego is located in the San Diego Air Basin ("Basin"), which is under the jurisdiction of the San Diego County Air Pollution Control District (SDCAPCD).

Federal and state standards have been established for ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulates less than 10 and 2.5 microns in diameter (PM_{10} and $PM_{2.5}$), and lead (Pb) (refer to Table 1).

Table 1
Current Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standards	California Standard
Ozone	1-Hour	---	0.09 ppm
	8-Hour	0.075 µg/m^3	0.070 µg/m^3
PM_{10}	24-Hour	150 µg/m^3	50 µg/m^3
	Annual	---	20 µg/m^3
$PM_{2.5}$	24-Hour	35 µg/m^3	---
	Annual	12 µg/m^3	12 µg/m^3
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	0.053 ppm	0.030 ppm
	1-Hour	0.100 ppm	0.18 ppm
Sulfur Dioxide	24-Hour	---	0.04 ppm
	1-Hour	0.075 ppm (primary)	0.25 ppm
Lead	30-Day Average	---	1.5 µg/m^3
	3-Month Average	0.15 µg/m^3	---

ppm = parts per million
µg/m^3 = micrograms per cubic meter
Source: California Air Resources Board, http://www.arb.ca.gov/research/aaqs/aaqs2.pdf June 4, 2013.

The local air quality management agency is required to monitor air pollutant levels to assure that air quality standards are met and, in the event they are not, to develop strategies to meet these standards. Depending on whether the standards are met or exceeded, the local air basin is classified as in "attainment" or "nonattainment." San Diego County is listed as a federal non-attainment area for ozone (eight hour), and a state non-attainment area for ozone (one hour and eight hour standards), PM_{10}, and $PM_{2.5}$. As shown in Table 2, the SDAB is in attainment for the state and federal standards for nitrogen dioxide, and for carbon monoxide.

Non-attainment status for the SDCAPCD is a result of several factors, primarily the naturally adverse meteorological conditions that limit the dispersion and diffusion of pollutants (surface and subsidence inversions), the limited capacity of the local airshed to eliminate pollutants from the air, and the number, type, and density of emission sources within the Basin. The potential health effects of pollutants for which the Basin is in nonattainment are described below.

Table 2
San Diego County Attainment Status

Criteria Pollutant	Federal Designation	State Designation
Ozone (one hour)	Attainment*	Non-Attainment
Ozone (eight hour)	Non-Attainment	Non-Attainment
Carbon Monoxide	Attainment	Attainment
PM_{10}	Unclassified**	Non-Attainment
$PM_{2.5}$	Attainment	Non-Attainment
Nitrogen Dioxide	Attainment	Attainment
Sulfur Dioxide	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	(no federal standard)	Attainment
Hydrogen Sulfide	(no federal standard)	Unclassified
Visibility	(no federal standard)	Unclassified

** The federal 1-hour standard of 12 ppm was in effect from 1979 through June 1, 2005. The revoked standard is referenced here because it was employed for such a long period and because this benchmark is addressed in SIPs.*

*** At the time of designation, if the available data does not support a designation of attainment or non-attainment, the area is designated as unclassifiable.*

Source: San Diego Air Pollution Control District. January 2010. http://www.sdapcd.org/info/facts/attain.pdf

Characteristics of ozone, carbon monoxide, nitrogen dioxide, and suspended particulates are described below.

Ozone

Ozone is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NO_X) and reactive organic gases (ROG)[1]. Nitrogen oxides are formed during the combustion of

[1] *Organic compound precursors of ozone are routinely described by a number of variations of three terms: hydrocarbons (HC), organic gases (OG), and organic compounds (OC). These terms are often modified by adjectives such as total, reactive, or volatile, and result in a rather confusing array of acronyms: HC, THC (total hydrocarbons), RHC (reactive hydrocarbons), TOG (total organic gases), ROG (reactive organic gases), TOC (total organic compounds), ROC (reactive organic compounds), and VOC (volatile organic compounds). While most of these differ in some significant way from a chemical perspective, from an air quality perspective*

fuels, while reactive organic compounds are formed during combustion and evaporation of organic solvents. Because ozone requires sunlight to form, it mostly occurs in concentrations considered serious between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans including respiratory and eye irritation and possible changes in lung functions. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

Carbon Monoxide

Carbon monoxide is a local pollutant that is found in high concentrations only near the source. The major source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations, therefore, are usually only found near areas of high traffic volumes. Carbon monoxide's health effects are related to its affinity for hemoglobin in the blood. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity and impaired mental abilities.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a by-product of fuel combustion, with the primary source being motor vehicles and industrial boilers and furnaces. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. Nitrogen dioxide is an acute irritant. A relationship between NO_2 and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. Nitrogen dioxide absorbs blue light and causes a reddish brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of PM_{10} and acid rain.

Suspended Particulates

PM_{10} is particulate matter measuring no more than 10 microns in diameter, while $PM_{2.5}$ is fine particulate matter measuring no more than 2.5 microns in diameter. Suspended particulates are mostly dust particles, nitrates and sulfates. Both PM_{10} and $PM_{2.5}$ are by-products of fuel combustion and wind erosion of soil and unpaved roads, and are directly emitted into the atmosphere through these processes. Suspended particulates are also created in the atmosphere through chemical reactions. The characteristics, sources, and potential health effects associated with the small particulates (those between 2.5 and 10 microns in diameter) and fine particulates ($PM_{2.5}$) can be very different. The small particulates generally come from windblown dust and dust kicked up from mobile sources. The fine particulates are generally associated with combustion processes as well as being formed in the atmosphere as a secondary pollutant through chemical reactions. Fine particulate matter is more likely to penetrate deeply into the lungs and poses a health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the small and fine particulate matter that is inhaled into the lungs remains there. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

two groups are important: non-photochemically reactive in the lower atmosphere, or photochemically reactive in the lower atmosphere (HC, RHC, ROG, ROC, and VOC).

Local Air Quality

The SDAPCD monitors air quality conditions at locations throughout the San Diego Air Basin. For the purpose of this analysis, data from the Kearney Villa Road monitoring station were used to characterize existing ozone conditions in the vicinity of the Subarea A, and to establish a baseline for estimating future conditions both with and without the Amendment. With the exception of PM_{10} data for 2012, all PM data (PM_{10} and $PM_{2.5}$) is reported from the El Cajon Redwood Street monitoring station. A summary of the data recorded at both the Kearney Villa Road and El Cajon Redwood Street monitoring stations from 2010 through 2012 is presented in Table 3.

Table 3
Ambient Air Quality Data

Pollutant	2010	2011	2012
Ozone, ppm - Worst Hour	0.073	0.093	0.099
Number of days of State 1-hour exceedances (>0.09 ppm)*	0	2	3
Number of days of Federal exceedances (>0.075 ppm)*	0	1	1
Particulate Matter <10 microns, $\mu g/m^3$ Worst 24 Hours	36	37	35
Number of samples of State exceedances (>50 $\mu g/m^3$)	0	0	0
Number of samples of Federal exceedances (>150 $\mu g/m^3$)	0	0	0
Particulate Matter <2.5 microns, $\mu g/m^3$ Worst 24 Hours	27.7	29.7	37.7
Number of samples of State exceedances (>50 $\mu g/m^3$)	N/A	N/A	N/A
Number of samples of Federal exceedances (>150 $\mu g/m^3$)	0	0	1

Ozone and PM10 data for 2010 and 2011 from Kearney Villa Road Monitoring Station
PM10 data for2010/2011 and PM2.5 data from El Cajon Redwood Street monitoring station
Source: California Air Resources Board, 2010, 2011, 2013 Annual Air Quality Data Summaries available at http://www.arb.ca.gov/adam/topfour/topfour1.php

As shown, both the federal and state ozone standards were exceeded at the Kearney Villa Road station during 2011 and 2012. The $PM_{2.5}$ concentration exceeded the state standards on one occasion in January of 2012.

Air Quality Management Plan/Regional Air Quality Strategy

The federal Clean Air Act Amendments (CAAA) mandate that states submit and implement a State Implementation Plan (SIP) for areas not meeting air quality standards. The SIP includes pollution control measures to demonstrate how the standards will be met through those measures. The SIP is established by incorporating measures established during the preparation of AQMPs and adopted rules and regulations by each local APCD and AQMD, which are submitted for approval to the ARB and the USEPA. The goal of an AQMP is to reduce pollutant concentrations below the National Ambient Air Quality Standards (NAAQS) through the implementation of air pollutant emissions controls.

The San Diego Regional Air Quality Strategy (RAQS) was developed pursuant to California Clean Air Act (CCAA) requirements. The RAQS was initially adopted in 1991 and was updated in 1995, 1998, 2001, 2004, and most recently in 2009 (SDAPCD, 2009). The RAQS identifies feasible emission control measures to provide progress in San Diego County toward attaining the State ozone standard. The pollutants addressed in the RAQS are volatile organic compounds (VOC) and oxides of nitrogen (NOx), precursors to the photochemical formation of ozone (the primary component of smog). The RAQS was initially adopted by the San Diego County Air Pollution Control Board on June 30, 1992, and amended on March 2, 1993, in response to ARB comments (2009 Revision of the Regional Air Quality Strategy, 2009). At present, no attainment plan for PM10 or P2.5 is required by the state regulations. However, SDCAPCD has also adopted measure to reduce particulate matter in San Diego County. These measures range from regulation against open burning to incentive programs that introduce cleaner technology. These measures can be found in a report titled "Measures to Reduce particulate Matter in San Diego County December 2005 found at the SDCAPCD website (http://www.sdapcd.org/info/reports/reports.html).

The RAQS relies on information from 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. 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 the County as part of the development of the individual General Plans. As such, projects that propose development 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 SDAPCD to control emissions from stationary sources. These SIP-approved rules may be used as a guideline to determine whether a project's emissions would have the potential to conflict with the SIP and thereby hinder attainment of the NAAQS for ozone.

Sensitive Receptors

Ambient air quality standards have been established to represent the levels of air quality considered sufficient, with an adequate margin of safety, to protect public health and welfare. They are designed to protect that segment of the public most susceptible to respiratory distress, such as children; the elderly; persons engaged in strenuous work or exercise; and people with cardiovascular and chronic respiratory diseases. Subarea A is primarily comprised of commercial and industrial uses. Multi-family uses are located northeast of Waring Road and Interstate 8 and south of Adobe Falls Road. A small area located northwest of the Mission Gorge Road/Vendever Avenue intersection is designated for multifamily use. Kaiser Hospital is located in the northwest corner of Subarea A. Single-family residences are located east/northeast of the Subarea A boundary; however, none are located within Subarea A. If the proposed Focused Plan Amendment is approved, approximately 6,780 new residences would

be allowed within the Subarea A. Construction could occur along the primary road corridors; thus, traffic would continue to be the primary source of air emissions within the area.

IMPACT ANALYSIS

Methodology and Significance Thresholds

Based on Appendix G of the *CEQA Guidelines*, a project would have a significant air quality impact if it would:

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

b) 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 any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);

d) Expose sensitive receptors to substantial pollutant concentrations; or

e) Create objectionable odors affecting a substantial number of people.

Air quality modeling was performed in general accordance with the methodologies outlined in the SDAPCD 2009 Regional Air Quality Strategy (RAQS). Maximum daily emissions were quantified using the CalEEMod version 2013.2.2 emissions model (refer to the Appendix for CalEEMod modeling output sheets).

Land use assumptions (8,275 dwelling units and 524,000 sf of commercial space) and total daily trips for the Focused Plan Amendment were based on the LLG traffic study, and were originally derived using the City of San Diego *Trip Generation Manual* (2003).

The SDAPCD has established screening level thresholds (screening criteria) for evaluating air quality emissions (Rules 20.1 et seq.). The City of San Diego has published quantitative thresholds for air pollutant emissions in its *CEQA Significance Determination Thresholds* (2011), shown in Table 4. These thresholds are based on Air Quality Impact Analysis (AQIA) trigger levels for new or modified stationary sources found in SDAPCD Rule 20.2. ROG thresholds are based on those used by South Coast Air Quality Management District (SCAQMD) and the Monterey Bay APCD (MBAPCD), which have similar federal and state attainment status as San Diego. A project may have a significant air quality impact if it could violate any air quality standard or contribute substantially to an existing or projected air quality violation, or release substantial quantities of air contaminants beyond the boundaries of the premises. A project's impact would also be significant if the project would conflict with, or obstruct implementation of, the RAQS Revision 2009.

Table 4
City of San Diego Pollutant Thresholds

	Carbon Monoxide (CO)	Nitrogen Oxides (NO_X)	Particulate Matter (PM_{10})	Sulfur Oxides (SO_X)	Reactive Organic Gases (ROG)
Threshold of Significance (lbs/day)	550	250	100	250	137

Source: City of San Diego CEQA Significance Determination Thresholds. http://www.sandiego.gov/development-services/pdf/news/sdtceqa.pdf

Construction Emissions

Construction associated with the Focused Plan Amendment would generate temporary air pollutant emissions. These impacts are associated with fugitive dust (PM_{10} and $PM_{2.5}$) and exhaust emissions from heavy construction vehicles, in addition to ROG that would be released during the drying phase upon application of architectural coatings.

Construction emissions modeling includes air emissions associated with demolition, site preparation, grading, building construction, paving, and application of architectural coatings. The City of San Diego Municipal Code (SDMC) Section 142.0710 requires that during construction "air contaminants including smoke, charred paper, dust, soot, grime, carbon, noxious acids, toxic fumes, gases, odors, and particulate matter, or any emissions that endanger human health, cause damage to vegetation or property, or cause soiling shall not be permitted to emanate beyond the boundaries of the premises upon which the use emitting the contaminants is located."

In order to reduce particulate matter emissions in accordance with SDMC Section 142.0710, the following may be utilized:

1. **Minimization of Disturbance.** Construction contractors should minimize the area disturbed by clearing, grading, earth moving, or excavation operations to prevent excessive amounts of dust.
2. **Soil Treatment.** Construction contractors should treat all graded and excavated material, exposed soil areas, and active portions of the construction site, including unpaved on-site roadways to minimize fugitive dust. Treatment shall include, but not necessarily be limited to, periodic watering, application of environmentally safe soil stabilization materials, and/or roll compaction as appropriate. Watering shall be done as often as necessary, and at least twice daily, preferably in the late morning and after work is done for the day.
3. **Soil Stabilization.** Construction contractors should monitor all graded and/or excavated inactive areas of the construction site at least weekly for dust stabilization. Soil stabilization methods, such as water and roll compaction, and environmentally safe dust control materials, shall be applied to portions of the construction site that are inactive for over four days. If no further grading or excavation operations are planned for the area, the area shall be seeded and watered until landscape growth is

evident, or periodically treated with environmentally safe dust suppressants, to prevent excessive fugitive dust.

4. **No Grading During High Winds.** Construction contractors should stop all clearing, grading, earth moving, and excavation operations during periods of high winds (20 miles per hour or greater, as measured continuously over a one-hour period).
5. **Street Sweeping.** Construction contractors should sweep all on-site driveways and adjacent streets and roads at least once per day, preferably at the end of the day, if visible soil material is carried over to adjacent streets and roads.

CalEEMod assumes that watering would occur at least twice daily in order to reduce particulate matter emissions in order to comply with SDMC Section 142.0710. This analysis also assumes that graded soils would be balanced and that no soil import or export would be required. In addition, it was assumed that architectural coatings would comply with SDAPCD Rule 67.0-Architectural Coatings.

The exact number and timing of all development projects that could occur under the proposed Focused Plan Amendment are unknown. However, since the area is heavily developed, it can be assumed future projects would involve the demolition of existing structures and improvements.

To illustrate the potential maximum daily air pollutant emissions from a project that could occur in the area, a hypothetical project was evaluated. The hypothetical project includes a 3-acre mixed-use project with 50 multi-family residential units, 5,000 square feet of commercial space, 5,000 square feet of retail space, and 150 parking spots. It is also assumed to involve the demolition of 10,000 square feet of industrial space.

As shown in Table 5, the hypothetical individual project is not expected to result in air pollutant emissions that exceed applicable thresholds. However, if several of these projects were to occur simultaneously, there is the potential to exceed significance thresholds.

Table 5
Estimated Maximum Daily Construction Emissions from Hypothetical Mixed-Use Project

	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions (lbs/day)	74.4	34.9	25.7	0.04	8.7	5.2
Threshold of Significance (lbs/day)	*137*	*250*	*550*	*250*	*100*	*N/A*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**N/A**

Notes: All calculations were made using CalEEMod. Assumes compliance with City of San Diego Municipal Code Section 142.0710 and with SDAPCD Rule 67.0 – Architectural Coatings. See Table 2.1 "Overall Construction (Maximum Daily Emission) in the appendix for calculations.

The hypothetical project discussed above is illustrative only. Approval of the proposed Focused Plan Amendment would not permit the construction of any individual project, and no specific development details are available at this time. The thresholds presented in Table 4 are applied on a project-by-project basis and are not used for assessment of regional planning impacts. The information is presented to illustrate the potential scope of air impacts for projects that could be reviewed under the Amendment. However, it is not anticipated that construction activities associated with individual projects that would occur if the proposed Focused Plan Amendment was adopted would result in a significant direct air quality impact. Should multiple projects occur at the same time, there could be a cumulatively considerable temporary increase in air pollution emissions.

Future projects within Subarea A would be required to demonstration compliance with APCD regulations and associated best management practices related to construction. Further, the proposed Focused Plan Amendment would add transit-oriented and mixed-use development in an area characterized by industrial and commercial uses. Therefore, the proposed plan would increase density and would accommodate construction activity near sensitive receptors. However, compliance with SDMC Section 142.0710 would reduce the potential for pollutants to affect nearby sensitive receptors (discussion on pages 9-10). Adherence to applicable SDAPCD and City of San Diego rules would reduce potential construction-related air pollution impacts to a less than significant level.

Long-Term Regional Impacts

Long-term emissions associated with future development in the plan area would be those associated with mobile (vehicle trips), area (landscaping and architectural coating emissions as the structures are repainted over the life of the development) and energy sources (electricity and natural gas consumption). According to the plan traffic study, development of the Focused Plan Amendment would add 8,275 units and 524,200 square feet (sf) of commercial space to the Subarea A. The long-term emissions take into account the removal of existing on-site industrial and commercial uses (1,114,500 square feet of industrial space and 162,900 sf of commercial space).

The estimated operational emissions from development associated with the Focused Plan Amendment as shown in Table 6 is for informational purposes.

As the Focused Plan Amendment is programmatic in nature, the project-level thresholds described in Table 4 do not apply to the estimated operational emissions shown in Table 6. Approval of the proposed Focused Plan Amendment would not permit the construction of any individual project, and no specific development details are available at this time. The information in Table 6 is presented to illustrate the potential scope of air impacts for projects that could be reviewed under the Focused Plan Amendment. The thresholds presented in Table 4 are applied on a project-by-project basis and are not used for assessment of regional planning impacts. Therefore, the significance determination for this analysis is based on the consistency of the Focused Plan Amendment with applicable air quality plans (see "Regional Air Quality Strategy (RAQS) Consistency" discussion below).

Table 6
Estimated Operational Emissions

	Estimated Emissions (lbs/day)					
	ROG	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Existing Development to be removed						
Area	35.5	<0.01	0.1	<0.01	<0.01	<0.01
Energy	0.7	6.5	5.4	0.04	0.5	0.5
Mobile	96.3	207.0	953.7	1.7	117.1	33.2
Subtotal	132.5	213.5	959.3	1.7	117.5	33.7
Proposed Focused Plan Amendment						
Area	228.6	7.8	600	0.03	3.8	3.8
Energy	1.4	12.4	6.5	0.08	1.0	1.0
Mobile	121.7	183.8	1,071.9	4.3	289.3	80.3
Subtotal	351.7	204.0	1,758.8	4.4	294.0	85.0
Net new emissions (proposed minus existing)	**219.2**	**(9.5)**	**799.5**	**2.7**	**176.5**	**51.3**

Notes: Assumes removal of existing commercial and industrial space and construction of 8,275 units and 524,000 sf of commercial space. All calculations were made with CalEEMod ver. 2013.2.2. See Table 2.2 "Overall Operational" in the appendix. Trip generation information from the traffic study (LLG, 2014). Assumes compliance with SDAPCD Rule 67.0 – Architectural Coatings. Summer emissions shown. Numbers may not add up due to rounding.
( ) = negative number

Regional Air Quality Strategy (RAQS) Consistency

The RAQS outlines the San Diego APCD's plans and control measures designed to attain the State air quality standards for ozone. In addition, the SDAPCD relies on the State Implementation Plan (SIP), which includes the SDAPCD's plans and control measures for attaining the ozone NAAQS. These plans account for emissions from all sources, including natural sources, through implementation of control measures, where feasible, on stationary sources to attain the standards. (Mobile sources are regulated by the United States EPA and the California ARB, and the emissions and reduction strategies related to mobile sources are considered in the RAQS and the SIP.)

The RAQS relies on information from ARB and SANDAG, including projected growth in the County, mobile, area and all other source emissions in order to project future emissions and determine from that the strategies necessary for the reduction of stationary source 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 during the development of general plans. Therefore, a project that proposes development that is consistent with the growth anticipated by the general plan is consistent with the RAQS.

San Diego's current population is 1,326,238 (DOF, 2013). The proposed Focused Plan Amendment could facilitate up to 8,275 dwelling units generating an estimated 15,888 new residents (based on an average household size of 1.92 persons). This would increase the City's

population by 1.2% to 1,342,126 (see Table 7). By comparison, the population forecasts in the City's General Plan, upon which the RAQS is based, estimate the City's 2020 population at 1,514,336 (an increase of 188,098 people from the current population) and the 2030 population at 1,656,257 (an increase of 330,019 from the current population) (City of San Diego General Plan Final PEIR, March 2008). See Table 8 for a comparison. Therefore, the additional 15,888 residents that could be added by the Focused Plan Amendment would be within RAQS population forecasts. Accordingly, because the Focused Plan Amendment would not conflict with or obstruct implementation of the applicable air quality plan, impacts would be less than significant.

Table 7
Population Growth with Focused Plan Amendment

	Population
San Diego Population	1,326,238
Proposed Focused Plan Amendment Buildout	15,888*
Total San Diego Population with Focused Plan Amendment	**1,342,126**
Percent Increase from Focused Plan Amendment	**1.2%**

Based on an average household size of 1.92 persons

Table 8
Population Growth with Focused Plan Amendment
Compared to Forecasted Population Growth

	2020	**2030**
Population Forecast	1,514,336	1,656,257
Increase Compared to Current Population	188,098	330,019
Percent Increase Compared to Current Population	14.2%	24.9%
Proposed Population Associated with Focused Plan Amendment development	15,888	15,888
Percent of Citywide Forecasted Growth Accounted for by Focused Plan Amendment	**8.4%**	**4.8%**

Objectionable Odors

The proposed residential and commercial projects associated with the Focused Plan Amendment do not include industrial or agricultural uses that have the potential to emit objectionable odors. The Focused Plan Amendment would remove industrial uses and the proposed mixed-use development would not be expected to create or emit objectionable odors. Therefore, this impact would be less than significant.

Local Carbon Monoxide Emissions

As previously discussed, carbon monoxide is a colorless, odorless, poisonous gas that may be found in high concentrations near areas of high traffic volumes. CO emissions are a function of

vehicle idling time, meteorological conditions, and traffic flow. The San Diego Air Basin is in attainment of state and federal CO standards. At the El Cajon-Redwood monitoring station, the station closest to Subarea A that measures CO, the maximum the maximum 8-hour CO level recorded in 2012 was 1.86 parts per million (ppm) and in 2011 was 1.46 ppm, approximately one-fifth of the 9 ppm state and federal 8-hour standard.

Although CO is not expected to be a major air quality concern in San Diego, elevated CO levels can occur at or near intersections that experience severe traffic congestion. A project's localized air quality impact is considered significant if the additional CO emissions resulting from the project create a "hot spot" where the California 1-hour standards of 20.0 ppm or the 8-hour standard of 9 ppm is exceeded. This typically occurs at severely congested intersections. Screening for possible elevated CO levels should be conducted for severely congested intersections experiencing levels of service E or F with project traffic where a significant project traffic impact may occur. The City of San Diego recommends a quantified assessment of CO hot spots if a development:

1. Causes a six-lane road to deteriorate to LOS E or worse;
2. Causes a six-lane road to drop to LOS F;
3. Causes a four-lane road to drop to LOS E or worse; or
4. If a proposed development is within 400 feet of a sensitive receptor and the LOS is worse than D.

According to the traffic study prepared by LLG (Table 8-1, January, 2014), eight intersections meet at least one of these criteria:

1. Friars Road/I-15 SB Ramps (AM)
2. Friars Road/Riverdale Street (AM and PM)
3. Mission Gorge Road/Zion Avenue (AM and PM)
4. Mission Gorge Road/Princess View Drive (AM)
5. Waring Road/Princess View Drive (AM)
6. Waring Road/Zion Avenue (AM and PM)
7. Fairmount Avenue/Mission Gorge Place (AM)
8. Fairmont Avenue/Alvarado Canyon Road/Camino Del Rio N (AM and PM)

The results of the CO hot spot model for the proposed project are shown in Table 9 (more detailed results are contained in the Appendix). As shown, CO levels at these intersections would not exceed federal or state AAQS for CO. Therefore, impacts would be less than significant.

Table 9
Intersection Carbon Monoxide (CO) Concentration

Intersection	Peak Hour	Peak Hour CO Levels With Project	Ambient Air Quality Standards Federal/ State	Exceeds State or Federal AAQS?
1. Friars Road/I-15 SB Ramps	AM	4.6	35.0 ppm/ 20.0 ppm	No
2. Friars Road/Riverdale Street	AM	4.7	35.0 ppm/ 20.0 ppm	No
	PM	5.4		
3. Mission Gorge Road/Zion Avenue	AM	4.4	35.0 ppm/ 20.0 ppm	No
	PM	5.1		
4. Mission Gorge Road/Princess View Drive	AM	3.6	35.0 ppm/ 20.0 ppm	No
5. Waring Road/Princess View Drive	AM	3.9	35.0 ppm/ 20.0 ppm	No
6. Waring Road/Zion Avenue	AM	4.0	35.0 ppm/ 20.0 ppm	No
	PM	4.1		
7. Fairmount Avenue/Mission Gorge Place	AM	4.6	35.0 ppm/ 20.0 ppm	No
8. Fairmont Avenue/Alvarado Canyon Road/Camino Del Rio N	AM	4.4	35.0 ppm/ 20.0 ppm	No
	PM	5.2		

Source: LOS data from LLG, 2014; CO concentration data from CALINE4 version 2.1 modeling program.
See Appendix B for modeling results.

GREENHOUSE GAS ANALYSIS

The purpose of this study is to analyze the Focused Plan Amendments' greenhouse gas emissions and the associated impact to Global Climate Change. This study provides an overview of Global Climate Change and greenhouse gases (GHGs), the current regulatory framework, quantifies GHG emissions associated with the Focused Plan Amendment in a "business-as-usual" scenario, compares forecast emissions to a range of qualitative thresholds, and discusses the Amendment's consistency with applicable mitigation strategies.

SETTING

Overview of Climate Change

Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period of time. The term "climate change" is often used interchangeably with the term "global warming," but "climate change" is preferred to "global warming" because it helps convey that there are other changes in addition to rising temperatures. The baseline against which these changes are measured originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. The global climate is continuously changing, as evidenced by repeated episodes of substantial warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed acceleration in the rate of warming during the past 150 years. Per the United Nations Intergovernmental Panel on Climate Change (IPCC, 2007), the understanding of anthropogenic warming and cooling influences on climate has led to a high confidence (90% or greater chance) that the global average net effect of human activities since 1750 has been one of warming. The prevailing scientific opinion on climate change is that most of the observed increase in global average temperatures, since the mid-20th century, is likely due to the observed increase in anthropogenic GHG concentrations (IPCC, 2007).

Greenhouse Gases (GHGs)

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with

agricultural practices and landfills. Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and sulfur hexafluoride (SF_6) (California Environmental Protection Agency [CalEPA], 2006). Different types of GHGs have varying global warming potentials (GWPs). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as "carbon dioxide equivalent" (CO_2E), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane CH_4 has a GWP of 25, meaning its global warming effect is 25 times greater than carbon dioxide on a molecule per molecule basis (IPCC, 2006).

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat trapping effect of GHG, Earth's surface would be about 34° C cooler (CalEPA, 2006). However, it is believed that emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations. The following discusses the primary GHGs of concern.

Carbon Dioxide

The global carbon cycle is made up of large carbon flows and reservoirs. Billions of tons of carbon in the form of CO_2 are absorbed by oceans and living biomass (i.e., sinks) and are emitted to the atmosphere annually through natural processes (i.e., sources). When in equilibrium, carbon fluxes among these various reservoirs are roughly balanced (United States Environmental Protection Agency [U.S. EPA], April 2012). CO_2 was the first GHG demonstrated to be increasing in atmospheric concentration, with the first conclusive measurements being made in the last half of the 20th century. Concentrations of CO_2 in the atmosphere have risen approximately 40% since the industrial revolution. The global atmospheric concentration of CO_2 has increased from a pre-industrial value of about 280 parts per million (ppm) to 391 ppm in 2011 (IPCC, 2007; Oceanic and Atmospheric Association [NOAA], 2010). The average annual CO_2 concentration growth rate was larger between 1995 and 2005 (average: 1.9 ppm per year) than it has been since the beginning of continuous direct atmospheric measurements (1960–2005 average: 1.4 ppm per year), although there is year-to-year variability in growth rates (NOAA, 2010). Currently, CO_2 represents an estimated 82.8% of total GHG emissions (Department of Energy [DOE] Energy Information Administration [EIA], August 2010). The largest source of CO_2, and of overall GHG emissions, is fossil fuel combustion.

Methane

Methane (CH_4) is an effective absorber of radiation, though its atmospheric concentration is less than that of CO_2 and its lifetime in the atmosphere is limited to 10 to 12 years. It has a global warming potential approximately 25 times that of CO_2. Over the last 250 years, the concentration of CH_4 in the atmosphere has increased by 148 percent (IPCC, 2007), although emissions have declined from 1990 levels. Anthropogenic sources of CH_4 include enteric fermentation associated with domestic livestock, landfills, natural gas and petroleum systems, agricultural activities, coal mining, wastewater treatment, stationary and mobile combustion, and certain industrial processes (U.S. EPA, April 2012).

Nitrous Oxide

Concentrations of nitrous oxide (N_2O) began to rise at the beginning of the industrial revolution and continue to increase at a relatively uniform growth rate (NOAA, 2010). N_2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizers that contain nitrogen, fossil fuel combustion, and other chemical processes. Use of these fertilizers has increased over the last century. Agricultural soil management and mobile source fossil fuel combustion are the major sources of N_2O emissions. The GWP of nitrous oxide is approximately 298 times that of CO_2 (IPCC, 2007).

Fluorinated Gases (HFCS, PFCS and SF_6)

Fluorinated gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfurhexafluoride (SF_6), are powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are used as substitutes for ozone-depleting substances such as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and halons, which have been regulated since the mid-1980s because of their ozone-destroying potential and are phased out under the Montreal Protocol (1987) and Clean Air Act Amendments of 1990. Electrical transmission and distribution systems account for most SF_6 emissions, while PFC emissions result from semiconductor manufacturing and as a by-product of primary aluminum production. Fluorinated gases are typically emitted in smaller quantities than CO_2, CH_4, and N_2O, but these compounds have much higher GWPs. SF_6 is the most potent GHG the IPCC has evaluated.

Greenhouse Gas Inventory

Worldwide anthropogenic emissions of GHGs were approximately 40,000 million metric tons (MMT) CO_2E in 2004, including ongoing emissions from industrial and agricultural sources, but excluding emissions from land use changes (i.e., deforestation, biomass decay) (IPCC, 2007). CO_2 emissions from fossil fuel use accounts for 56.6 percent of the total emissions of 49,000 MMT CO_2E (includes land use changes) and CO_2 emissions from all sources account for 76.7 percent of the total CO_2E emitted. Methane emissions account for 14.3 percent of GHGs and N_2O emissions account for 7.9 percent (IPCC, 2007).

Total U.S. GHG emissions were 6,821.8 MMT CO_2E in 2009 (U.S. EPA, April 2012). Total U.S. emissions have increased by 10.5 percent since 1990; emissions rose by 3.2 percent from 2009 to 2010 (U.S. EPA, April 2012). This increase was primarily due to (1) an increase in economic output resulting in an increase in energy consumption across all sectors; and (2) much warmer summer conditions resulting in an increase in electricity demand for air conditioning. Since 1990, U.S. emissions have increased at an average annual rate of 0.5 percent. In 2010, the transportation and industrial end-use sectors accounted for 32 percent and 26 percent of CO_2 emissions from fossil fuel combustion, respectively. Meanwhile, the residential and commercial end-use sectors accounted for 22 percent and 19 percent of CO_2 emissions from fossil fuel combustion, respectively (U.S. EPA, April 2012).

Based upon the California Air Resources Board (ARB) California Greenhouse Gas Inventory for 2000-2011 (ARB, October 2011), California produced 448 MMT CO_2E in 2011. The major source of GHG in California is transportation, contributing 38 percent of the state's total GHG emissions. Industrial activity is the second largest source, contributing 21 percent of the state's GHG emissions (ARB, October 2012). California emissions are due in part to its large size and large

population compared to other states. However, a factor that reduces California's per capita fuel use and GHG emissions, as compared to other states, is its relatively mild climate. The ARB has projected statewide unregulated GHG emissions for the year 2020 will be 507 MMT CO_2E (ARB, August 2013). These projections represent the emissions that would be expected to occur in the absence of any GHG reduction actions.

Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Long-term trends have found that each of the past three decades has been warmer than all the previous decades in the instrumental record, and the decade from 2000 through 2010 has been the warmest. The global combined land and ocean temperature data show an increase of about 0.89°C (0.69°C–1.08°C) over the period 1901–2012 and about 0.72°C (0.49°C–0.89°C) over the period 1951–2012 when described by a linear trend. Several independently analyzed data records of global and regional Land-Surface Air Temperature (LSAT) obtained from station observations are in agreement that LSAT as well as sea surface temperatures have increased. In addition to these findings, there are identifiable signs that global warming is currently taking place, including substantial ice loss in the Arctic over the past two decades (IPCC, 2013).

According to the CalEPA's *2010 Climate Action Team Biennial Report*, potential impacts of climate change in California may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (CalEPA, April 2010). Below is a summary of some of the potential effects that could be experienced in California as a result of climate change.

Sea Level Rise

According to *The Impacts of Sea-Level Rise on the California Coast*, prepared by the California Climate Change Center (CCCC) (May 2009), climate change has the potential to induce substantial sea level rise in the coming century. The rising sea level increases the likelihood and risk of flooding. Sea levels are rising faster now than in the previous two millennia, and the rise is expected to accelerate, even with robust GHG emission control measures. The most recent IPCC report (2013) predicts a mean sea–level rise of 11-38 inches by 2100. This prediction is more than 50% higher than earlier projections of 7-23 inches, when comparing the same emissions scenarios and time periods. The previous IPCC report (2007) identified a sea level rise on the California coast over the past century of approximately eight inches. Based on the results of various global climate change models, sea level rise is expected to continue. The California Climate Adaptation Strategy (December 2009) estimates a sea level rise of up to 55 inches by the end of this century.

Air Quality

Higher temperatures, which are conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in

turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thereby ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state (California Energy Commission [CEC], March, 2009).

Water Supply

Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future water supplies in California. However, the average early spring snowpack in the Sierra Nevada decreased by about 10 percent during the last century, a loss of 1.5 million acre-feet of snowpack storage. During the same period, sea level rose eight inches along California's coast. California's temperature has risen 1°F, mostly at night and during the winter, with higher elevations experiencing the highest increase. Many Southern California cities have experienced their lowest recorded annual precipitation twice within the past decade. In a span of only two years, Los Angeles experienced both its driest and wettest years on record (California Department of Water Resources [DWR], 2008; CCCC, May 2009).

This uncertainty complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. The Sierra snowpack provides the majority of California's water supply by accumulating snow during the state's wet winters and releasing it slowly during the state's dry springs and summers. Based upon historical data and modeling DWR projects that the Sierra snowpack will experience a 25 to 40 percent reduction from its historic average by 2050. Climate change is also anticipated to bring warmer storms that result in less snowfall at lower elevations, reducing the total snowpack (DWR, 2008).

Hydrology

As discussed above, climate change could potentially affect: the amount of snowfall, rainfall, and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. The rate of increase of global mean sea levels over the 2001-2010 decade, as observed by satellites, ocean buoys and land gauges, was approximately 3.2 mm per year, which is double the observed 20th century trend of 1.6 mm per year (World Meteorological Organization [WMO],2013). As a result, sea levels averaged over the last decade were about 8 inches higher than those of 1880 (WMO, 2013). Sea level rise may be a product of climate change through two main processes: expansion of sea water as the oceans warm and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply due to salt water intrusion. Increased CO_2 emissions can cause oceans to acidify due to the carbonic acid it forms. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture
California has a $30 billion annual agricultural industry that produces half of the country's fruits and vegetables. Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater air pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (CCCC, 2006).

Ecosystems and Wildlife
Climate change and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Increasing concentrations of GHGs are likely to accelerate the rate of climate change. Scientists project that the average global surface temperature could rise by 1.0-4.5°F (0.6-2.5°C) in the next 50 years, and 2.2-10°F (1.4-5.8°C) in the next century, with substantial regional variation. Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. Rising temperatures could have four major impacts on plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes, such as carbon cycling and storage (Parmesan, 2004; Parmesan, C. and H. Galbraith, 2004).

While the above discussion identifies the possible effects of climate change at a global and potentially statewide level, current scientific modeling tools are unable to predict with a similar degree of accuracy what local impacts may occur. In general, regional and local predictions are made based on downscaling statewide models (CalEPA, April 2010).

Regulatory Setting

International Regulations
The United States is, and has been, a participant in the United Nations Framework Convention on Climate Change (UNFCCC) since it was produced in 1992. The UNFCCC is an international environmental treaty with the objective of, "stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." This is generally understood to be achieved by stabilizing global GHG concentrations between 350 and 400 ppm, in order to limit the global average temperature increases between 2 and 2.4°C above pre-industrial levels (IPCC, 2007). The UNFCC itself does not set limits on GHG emissions for individual countries or enforcement mechanisms. Instead, the treaty provides for updates, called "protocols," that would identify mandatory emissions limits.

Five years later, the UNFCC brought nations together again to draft the *Kyoto Protocol* (1997). The Kyoto Protocol established commitments for industrialized nations to reduce their collective emissions of six GHGs (CO_2, CH_4, N_2O, SF_6, HFCs, and PFCs) to 5.2 percent below 1990 levels by 2012. The United States is a signatory of the Kyoto Protocol, but Congress has not ratified it and the United States has not bound itself to the Protocol's commitments (UNFCCC, 2007). The first commitment period of the Kyoto Protocol ended in 2012. Governments, including 38 industrialized countries, agreed to a second commitment period of the Kyoto Protocol beginning January 1, 2013 and ending either on December 31, 2017 or December 31,

2020, to be decided by the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol at its seventeenth session (UNFCCC, November 2011).

In Durban (17th session of the Conference of the Parties in Durban, South Africa, December 2011), governments decided to adopt a universal legal agreement on climate change as soon as possible, but not later than 2015. Work will begin on this immediately under a new group called the Ad Hoc Working Group on the Durban Platform for Enhanced Action. Progress was also made regarding the creation of a Green Climate Fund (GCF) for which a management framework was adopted (UNFCCC, December 2011; United Nations, September 2012).

Federal Regulations

The United States is currently using a voluntary and incentive-based approach toward emissions reductions in lieu of the Kyoto Protocol's mandatory framework. The Climate Change Technology Program (CCTP) is a multi-agency research and development coordination effort (led by the Secretaries of Energy and Commerce) that is charged with carrying out the President's National Climate Change Technology Initiative (U.S. EPA, December 2007). However, the voluntary approach to address climate change and GHG emisions may be changing. The United States Supreme Court in *Massachusetts et al. v. Environmental Protection Agency et al*. ([2007] 549 U.S. 05-1120) held that the U.S. EPA has the authority to regulate motor-vehicle GHG emissions under the federal Clean Air Act.

The U.S. EPA issued a Final Rule for mandatory reporting of GHG emissions in October 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and vehicle engines, and requires annual reporting of emissions. The first annual reports for these sources were due in March 2011.

On May 13, 2010, the U.S. EPA issued a Final Rule that took effect on January 2, 2011, setting a threshold of 75,000 metric tons (MT) CO_2E per year for GHG emissions. New and existing industrial facilities that meet or exceed that threshold will require a permit after that date. On November 10, 2010, the U.S. EPA published the "PSD and Title V Permitting Guidance for Greenhouse Gases." The U.S. EPA's guidance document is directed at state agencies responsible for air pollution permits under the Federal Clean Air Act to help them understand how to implement GHG reduction requirements while mitigating costs for industry. It is expected that most states will use the U.S. EPA's new guidelines when processing new air pollution permits for power plants, oil refineries, cement manufacturing, and other large pollution point sources.

On January 2, 2011, the U.S. EPA implemented the first phase of the Tailoring Rule for GHG emissions Title V Permitting. Under the first phase of the Tailoring Rule, all new sources of emissions are subject to GHG Title V permitting if they are otherwise subject to Title V for another air pollutant and they emit at least 75,000 MT CO_2E per year. Under Phase 1, no sources were required to obtain a Title V permit solely due to GHG emissions. Phase 2 of the Tailoring Rule went into effect July 1, 2011. At that time new sources were subject to GHG Title V permitting if the source emits 100,000 MT CO_2E per year, or they are otherwise subject to Title V permitting for another pollutant and emit at least 75,000 MT CO_2E per year.

On July 3, 2012 the U.S. EPA issued the final rule that retains the GHG permitting thresholds that were established in Phases 1 and 2 of the GHG Tailoring Rule. These emission thresholds determine when Clean Air Act permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities.

California Regulations

California Air Resources Board (ARB) is responsible for the coordination and oversight of State and local air pollution control programs in California. Various statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness about climate change and its potential for severe long-term adverse environmental, social, and economic effects.

Assembly Bill (AB) 1493 (2002), referred to as "Pavley," requires ARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, U.S. EPA granted the waiver of Clean Air Act preemption to California for its greenhouse gas emission standards for motor vehicles beginning with the 2009 model year. Pavley I took effect for model years starting in 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG" will cover 2017 to 2025. Fleet average emission standards would reach 22 percent reduction by 2012 and 30 percent by 2016. The Advanced Clean Cars program coordinates the goals of the Low Emissions Vehicles (LEV), Zero Emissions Vehicles (ZEV), and Clean Fuels Outlet programs and would provide major reductions in GHG emissions. By 2025, when the rules would be fully implemented, new automobiles would emit 34% fewer GHGs. Statewide CO_2E emissions would be reduced by 3% by 2020 and by 12% by 2025. The reduction increases to 27% in 2035 and even further to a 33% reduction in 2050 (ARB, 2013).

In 2005, former Governor Schwarzenegger issued Executive Order (EO) S-3-05, establishing statewide GHG emissions reduction targets. EO S-3-05 provides that by 2010, emissions shall be reduced to 2000 levels; by 2020, emissions shall be reduced to 1990 levels; and by 2050, emissions shall be reduced to 80 percent of 1990 levels (CalEPA, 2006). In response to EO S-3-05, CalEPA created the Climate Action Team (CAT), which in March 2006 published the Climate Action Team Report (the "2006 CAT Report") (CalEPA, 2006). The 2006 CAT Report identified a recommended list of strategies that the state could pursue to reduce GHG emissions. These are strategies that could be implemented by various state agencies to ensure that the emission reduction targets in EO S-3-05 are met and can be met with existing authority of the state agencies. The strategies include the reduction of passenger and light duty truck emissions, the reduction of idling times for diesel trucks, an overhaul of shipping technology/infrastructure, increased use of alternative fuels, increased recycling, and landfill methane capture, etc.

California's major initiative for reducing GHG emissions is outlined in Assembly Bill 32 (AB 32), the "California Global Warming Solutions Act of 2006," signed into law in 2006. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 (essentially a 15% reduction below 2005 emission levels; the same requirement as under S-3-05), and requires ARB to prepare a Scoping Plan that outlines the main State strategies for reducing GHGs to meet the 2020 deadline. In addition, AB 32 requires ARB to adopt regulations to require reporting and verification of statewide GHG emissions.

After completing a comprehensive review and update process, ARB approved a 1990 statewide GHG level and 2020 limit of 427 MMT CO_2E. The Scoping Plan was approved by ARB on December 11, 2008, and includes measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. The Scoping Plan includes a range of GHG reduction actions that may include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms.

In early 2013, ARB initiated activities to update the AB 32 Scoping Plan. The 2013 Scoping Plan update will define ARB's climate change priorities and lay the groundwork to reach post-2020 goals set forth in EO S-3-05. The update will highlight California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan (2008). It will also evaluate how to align the State's longer-term GHG reduction strategies with other State policy priorities, such as for water, waste, natural resources, clean energy and transportation, and land use (ARB, 2013)

EO S-01-07 was enacted on January 18, 2007. The order mandates that a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020.

Senate Bill (SB) 97, signed in August 2007, acknowledges that climate change is an environmental issue that requires analysis in CEQA documents. In March 2010, the California Resources Agency (Resources Agency) adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts.

ARB Resolution 07-54 establishes 25,000 MT of GHG emissions as the threshold for identifying the largest stationary emission sources in California for purposes of requiring the annual reporting of emissions. This threshold is just over 0.005 percent of California's total inventory of GHG emissions for 2004.

SB 375, signed in August 2008, enhances the state's ability to reach AB 32 goals by directing ARB to develop regional GHG emission reduction targets to be achieved from vehicles for 2020 and 2035. In addition, SB 375 directs each of the state's 18 major Metropolitan Planning Organizations (MPO) to prepare a "sustainable communities strategy" (SCS) that contains a growth strategy to meet these emission targets for inclusion in the Regional Transportation Plan (RTP). On September 23, 2010, ARB adopted final regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035.

In April 2011, Governor Brown signed SB 2X requiring California to generate 33% of its electricity from renewable energy by 2020.

For more information on the Senate and Assembly Bills, Executive Orders, and reports discussed above, and to view reports and research referenced above, please refer to the following websites: www.climatechange.ca.gov and www.arb.ca.gov/cc/cc.htm.

Local Regulations and CEQA Requirements

Pursuant to the requirements of SB 97, the Resources Agency has adopted amendments to the *State CEQA Guidelines* for the feasible mitigation of GHG emissions or the effects of GHG emissions. As noted previously, the adopted *CEQA Guidelines* provide general regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts. To date, the Bay Area Air Quality Management District (BAAQMD), the South Coast Air Quality Management District (SCAQMD), the San Luis Obispo Air Pollution Control District (SLOAPCD), and the San Joaquin Air Pollution Control District (SJVAPCD) have adopted quantitative significance thresholds for GHGs. On March 5, 2012 the Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds contained in the BAAQMD's 2010 CEQA Guidelines. In light of the court's order, it is recommended that lead agencies will need to determine appropriate air quality and GHG thresholds of significance based on substantial evidence in the record. The BAAQMD was ordered to set aside the thresholds and is no longer recommending that these thresholds be used as a general measure of a project's significant air quality impacts. In August 2013, the First District Court of Appeal overturned the trial court and held that the thresholds of significance adopted by the BAAQMD were not subject to CEQA review. However, no further recommendation by the BAAQMD has been issued as of November 15, 2013.

The City of San Diego adopted a Climate Protection Action Plan (CPAP) in 2005 which aims to achieve at least a 15% reduction in CO_2 emissions from City operations through energy efficiency, renewable energy, and cleaner fuels.

In 2010, the City of San Diego released a memorandum titled *Addressing Greenhouse Gas Emissions from Projects Subject to CEQA*, which provides a 900-metric-ton screening criteria for determining which projects require further analysis and mitigation with regard to climate change based on the CAPCOA *CEQA and Climate Change* white paper.

In October 2011, the San Diego Association of Governments (SANDAG) adopted a Regional Transportation Plan and Sustainable Communities Strategy (SCS) in accordance with SB 375. The SCS lays out how the region will meet greenhouse gas (GHG) reduction targets set by the California Air Resources Board. ARB's targets call for the region to reduce per capita emissions seven percent by 2020 and 13 percent by 2035 from a 2005 baseline.

In December 2013, the City released a working draft of a Climate Action Plan (CAP) which identifies measures to reduce GHG. The five strategies to reduce GHGs in the CAP include: energy & water efficient buildings, clean & renewable energy, multimodal transportation options, zero waste management, and urban forest & local food production. The CAP does not contain GHG thresholds.

IMPACT ANALYSIS

Thresholds of Significance

The information provided in this section is based on recently established California goals for reducing GHG emissions, as well as a project-specific emissions inventory developed for onsite development. According to the CEQA Guidelines (Appendix G), impacts associated with GHG emissions would be significant if the project would:

1) *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*
2) *Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?*

Determining how a development project might contribute to climate change, and what the overall effect of an individual project would be based on that contribution, is still undergoing debate at this time. An individual project (unless it is a massive construction project, such as a dam or a new freeway project, or a large fossil-fuel fired power plant) does not generate sufficient GHG emissions to directly influence global climate change; therefore, the issue of global climate change typically involves an analysis of whether the contribution toward a cumulative impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

Based on the City of San Diego's memorandum *Addressing Greenhouse Gas Emissions from Projects Subject to CEQA* (August 2010), a 900 metric ton screening threshold for determining when a GHG analysis is required was chosen. The 900 metric ton screening threshold is based on available guidance from the CAPCOA white paper. If GHG emissions associated with a proposed project exceed the 900 metric ton screening threshold, the project would have a significant impact related to climate change unless the project reduces emissions by at least 28.3% from the ARB 2020 "business-as-usual" forecast model, which represents the GHG emissions that would be expected to occur without any GHG project reducing features or mitigation, consistent with AB 32. The City of San Diego does not have thresholds for program-level analysis. Though the proposed Focused Plan Amendment is programmatic in nature, the 900 MT screening threshold for individual projects is used in this analysis.

Methodology

This analysis is based on the methodologies recommended by the California Air Pollution Control Officers Association [CAPCOA] (January 2008) *CEQA and Climate Change* white paper. The analysis focuses on CO_2, N_2O, and CH_4 as these are the GHG emissions that onsite development would generate in the largest quantities. Fluorinated gases, such as HFCs, PFCs, and SF_6, were also considered for the analysis. However, because the Amendment involves commercial and residential uses, the quantity of fluorinated gases would not be significant since fluorinated gases are primarily associated with industrial processes. Calculations were based on the methodologies discussed in the CAPCOA white paper (January 2008) and included the use of the California Climate Action Registry General Reporting Protocol (January 2009).

Construction Emissions

Although construction activity is addressed in this analysis, CAPCOA does not discuss whether any of the suggested threshold approaches (as discussed below in *GHG Cumulative Significance*) adequately address impacts from temporary construction activity. As stated in the *CEQA and Climate Change* white paper, "more study is needed to make this assessment or to develop separate thresholds for construction activity" (CAPCOA, 2008). Nevertheless, the City of San Diego has recommended amortizing construction-related emissions over a 30-year period in conjunction with the proposed project's operational emissions.

Construction of future development in the plan area would generate temporary GHG emissions primarily due to the operation of construction equipment and truck trips. Site grading typically generates the greatest amount of emissions due to the use of grading equipment and soil hauling. For this analysis, it was assumed that construction of development associated with the Focused Plan Amendment would commence in January 2015 and would be completed in 2035. Emissions associated with the construction period were estimated using the California Emissions Estimator Model (CalEEMod version 2013.2.2) computer model, based on the projected maximum amount of equipment that would be used onsite at one time. Complete CalEEMod results and assumptions can be viewed in Appendix A.

Indirect Emissions

Operational emissions from electricity and natural gas use were estimated using CalEEMod (see Appendix A for calculations). The default values on which CalEEMod are based include the California Energy Commission (CEC) sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies. CalEEMod calculates operational emissions of CO_2, N_2O and CH_4. This methodology is considered reasonable and reliable for use, as it has been subjected to peer review by numerous public and private stakeholders, and in particular by the CEC. It is also recommended by CAPCOA (January 2008).

Emissions from waste generation were also calculated in CalEEMod and are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CalEEMod User Guide, 2011). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by the California Department of Resources Recycling and Recovery (CalRecycle).

Emissions from water and wastewater use calculated in the CalEEMod model were based on the default electricity intensity is from the CEC's 2006 Refining Estimates of Water-Related Energy Use in California using the average values for Northern and Southern California.

Direct Emissions from Mobile Combustion

Emissions of CO_2 and CH_4 from transportation sources for the business-as-usual scenario were quantified using the CalEEMod computer model. Because CalEEMod does not calculate N_2O emissions from mobile sources, N_2O emissions were quantified using the California Climate Action Registry General Reporting Protocol (January 2009) direct emissions factors for mobile combustion (see Appendix A for calculations). Trip generation rates are from the traffic study (LLG, 2014). Emission rates for N_2O emissions were based on the vehicle mix output generated by CalEEMod and the emission factors found in the California Climate Action Registry General Reporting Protocol.

One of the limitations to a quantitative analysis is that emission models, such as CalEEMod, evaluate aggregate emissions and do not demonstrate, with respect to a global impact, what proportion of these emissions are "new" emissions, specifically attributable to the project in question. For most projects, the main contribution of GHG emissions is from motor vehicles and the total vehicle miles traveled (VMT), but the quantity of these emissions appropriately characterized as "new" is uncertain. Traffic associated with a project may be trips that would have been associated with another use, and consequently, the actual VMT associated with the project may be higher or lower than what is included in the model results. For the plan area development analyzed in this report, it is likely that some of the GHG emissions associated with traffic and energy demand would be truly "new" emissions. However, it is also likely that some of the emissions represent a diversion of emissions from other locations. Thus, although GHG emissions are associated with onsite development, it is not possible to discern how much diversion is occurring or what fraction of those emissions represents global increases. In the absence of information regarding the different types of trips, the VMT estimate generated by CalEEMod is used as a conservative, "worst-case" estimate.

Estimate of GHG Emissions

Construction Emissions

Construction activity is assumed to occur over a period of approximately 20 years between 2015 and 2035. Based on CalEEMod results, construction activity associated with the Focused Plan Amendment would generate an estimated 99,718 metric tons of carbon dioxide equivalent (CO_2E), as shown in Table 10. Amortized over a 30-year period (the assumed life of the project), construction of the development in Subarea A would generate 3,324 metric tons of CO_2E per year.

Table 10
Estimated Construction Related Greenhouse Gas Emissions

Year	Annual Emissions (MT CO_2E)
Total	99,718
Amortized over 30 years	**3,324 metric tons per year**

See Appendix for CalEEMod software program output for new construction.

Operational Indirect and Stationary Direct Emissions

Long-term emissions relate to energy use, solid waste, water use, and transportation. Each source is discussed below and includes the emissions associated with existing development and the anticipated emissions that would result from development associated with the Focused Plan Amendment.

Energy Use
Operation of onsite development would consume both electricity and natural gas (see Appendix for CalEEMod results). The generation of electricity through combustion of fossil fuels typically yields CO_2, and to a smaller extent, N_2O and CH_4. Natural gas emissions can be

calculated using default values from the CEC sponsored CEUS and RASS studies which are built into CalEEMod. As shown in Table 11, the overall net increase in energy use within Subarea A would result in approximately 7,874 metric tons of CO_2E per year.

Table 11
Estimated Annual Energy-Related Greenhouse Gas Emissions

Emission Source	Annual Emissions (MT CO_2E)
Existing Uses	
Electricity Natural Gas *Subtotal*	6,233 metric tons 1,293 metric tons *7,527 metric tons*
Focused Plan Amendment	
Electricity Natural Gas *Subtotal*	12,230 metric tons 3,171 metric tons *15,401 metric tons*
Total Net New Emissions (Proposed minus Existing)	**7,874 metric tons**

See Appendix for CalEEMod software program output. Numbers may not add up due to rounding.

Area Emissions

The CalEEMod model was used to calculate direct sources of air emissions located throughout the potential new residential and commercial sites in Subarea A. This includes hearths, consumer product use, architectural coatings, and landscape maintenance equipment. As shown in Table 12, the area sources would generate approximately 102 net new metric tons CO_2E per year.

Table 12
Estimated Annual Area Greenhouse Gas Emissions

Emission Source	Annual Emissions (CO_2E)
Existing Uses	0.02 metric tons
Focused Plan Amendment	102 metric tons
Total Net New Emissions (Proposed minus Existing)	**102 metric tons**

See Appendix for CalEEMod software program output.

Solid Waste Emissions

The CalEEMod results indicate that Subarea A development would result in approximately 1,612 metric tons of CO_2E per year associated with solid waste disposed within landfills (see Table 13).

Table 13
Estimated Annual Solid Waste Greenhouse Gas Emissions

Emission Source	Annual Emissions (CO_2E)
Existing Uses	353 metric tons*
Focused Plan Amendment	1,965 metric tons
Total Net New Emissions (Proposed minus Existing)	**1,612 metric tons**

See Appendix for CalEEMod software program output
**Assumes existing uses onsite are diverting 50% of waste in accordance with AB 939.*

Water Use Emissions

Based on the amount of electricity generated to supply and convey water for development within Subarea A, as shown in Table 14, water use associated with the Focused Plan Amendment development would generate approximately 3,443 metric tons of CO_2E per year.

Table 14
Estimated Annual Water Use Greenhouse Gas Emissions

Emission Source	Annual Emissions (CO_2E)
Existing Uses	1,525 metric tons
Focused Plan Amendment	4,968 metric tons
Total Net New Emissions (Proposed minus Existing)	**3,443 metric tons**

See Appendix for CalEEMod software program output.

Table 15
Estimated Annual Mobile Emissions of Greenhouse Gases

Emission Source	Annual Emissions (CO_2E)
Existing uses	
Mobile Emissions (CO_2 & CH_4) Mobile Emissions (N_2O) [1]	19,105 metric tons 908 metric tons
Subtotal	*20,013 metric tons*
Focused Plan Amendment	
Mobile Emissions (CO_2 & CH_4) Mobile Emissions (N_2O) [1]	57,959 metric tons 3,648 metric tons
Subtotal	*61,607 metric tons*
Total	**41,594 metric tons**

See Appendix for CalEEMod software program output.
[1] California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1,January 2009, page 30-35. See Appendix for calculations.

Transportation Emissions
Mobile source GHG emissions were estimated using the average daily trips calculated by CalEEMod. Table 15 shows the estimated mobile emissions of GHGs based on the estimated annual VMT. CalEEMod does not calculate N_2O emissions related to mobile sources. As such, N_2O emissions were calculated based on the Amendment's VMT using calculation methods provided by the California Climate Action Registry General Reporting Protocol (January 2009). As shown in Table 15, the Focused Plan Amendment would increase vehicle emissions from the Subarea A by approximately 41,594 metric tons per year.

Combined Construction, Stationary and Mobile Source Emissions

Table 16 combines the net new construction, operational, and mobile GHG emissions associated with the Focused Plan Amendment. As discussed above, temporary emissions associated with construction activity are amortized over 30 years (the anticipated life of the project).

Table 16
Combined Annual Net New GHG Emissions
from Focused Plan Amendment

Emission Source	Annual Emissions (CO_2E)
Existing Uses	
Construction	N/A
Operation	
Energy	7,527 metric tons
Area	0.02 metric tons
Solid Waste	353 metric tons
Water	1,525 metric tons
Mobile	20,013 metric tons
Subtotal	*29,418 metric tons*
Focused Plan Amendment	
Construction	3,324 metric tons
Operation	
Energy	15,401 metric tons
Area	102 metric tons
Solid Waste	1,965 metric tons
Water	4,968 metric tons
Mobile	61,607 metric tons
Subtotal	*87,367 metric tons*
Total Net New Emissions	**57,949 metric tons**

The combined annual net increase in CO_2E emissions would total approximately 57,949 metric tons per year.

GHG Cumulative Significance
As discussed above, the calculations shown in Tables 10 through 16 assume unmitigated "business as usual" (BAU) emissions. The BAU calculation is an estimate of GHG emissions that

would be expected to occur without any GHG reducing features or mitigation, consistent with AB 32. In the absence of specific federal, state or local thresholds, GHG emissions associated with a specific project are not considered cumulatively considerable if design and operational features incorporated into a project reduces emissions by more than approximately 28.3% (the statewide average that is commonly acceptable). Although the proposed Focused Plan Amendment is programmatic in nature (not a specific project) and does not include individual projects, the following discussion uses the 900 MT annual screening threshold as the City does not currently have a programmatic or plan level threshold.

As shown in Table 16, BAU GHG emissions would exceed the 900 annual MT screening threshold. Therefore, a 28.3% (24,725 annual MT of CO_2E) reduction in BAU emissions must be demonstrated to avoid a significant GHG impact.

For development in the Subarea A, GHG emissions would be reduced in comparison to the BAU scenario as a result of project amenities and design and operational features along with state and federal GHG reduction measures. The Focused Plan Amendment would reduce vehicle trips compared to BAU because of its proximity to existing transit service (bus and trolley service), increased density onsite (urban infill), mixed-use nature, and pedestrian friendly design. Individual development projects within the plan area would also be required to achieve at least a 50% waste diversion rate in accordance with AB 939 and to incorporate low flow plumbing fixtures in accordance with City of San Diego code requirements (Section 147.0301). Table 17 shows the mitigated GHG emissions associated with implementing the above-referenced design/operational features. With implementation of these features, GHG emissions would be reduced by 17,905 MT CO_2E annually or 20.5%.

Table 18 lists existing State measures for GHG emissions reductions and quantifies the total reduction in metric tons of CO_2E per year that development of the plan area would generate in comparison to the BAU scenario. As shown in Table 18, implementation of State measures would reduce project area emissions by an estimated 20,743 MT CO_2E per year.

As shown in Table 19, the Focused Plan Amendments' design features (Table 17) and State reduction measures (Table 18) would have a combined total reduction of approximately 38,648 MT CO_2E per year or approximately 44.2%. As such, GHG emissions associated with project area development would be reduced by more than 28.3% as compared to the BAU scenario. Therefore, impacts related to GHG emissions would be less than significant based on City criteria.

Table 17
Combined Annual GHG Emissions with Design Features to Reduce Emissions

Emission Source / Design Feature to Reduce GHG Emissions	Reduction in Annual Emissions (MT CO_2E)
Solid Waste Implement on –site recycling program to achieve 50% landfill diversion.	(982)
Water Water Use Reduction a) Low Flow Plumbing Fixtures – Install low flow plumbing fixtures in all building to reduce water use. b) Drought Tolerant Landscaping – Install landscaping throughout the site that would provid shade trees and carbon storage.	(791)
Transportation a) Increase density b) Improve walkability design c) Improve accessibility d) Increase transit accessibility e) Improve pedestrian network Mobile Emissions (CO_2 & CH_4) Mobile Emissions (N_2O)	 (15,150) (982)
Total Reduction from with Design Features to Reduce GHG Emissions	**(17,905 MT CO_2E)**
Total Emissions from Project with Design Features to Reduce GHG Emissions	**69,462 MT CO_2E**
BAU Total	**87,367 MT CO_2E**
% Reduction of Emissions Compared to BAU Total	**(20.5%)**

Sources: See Appendix for calculations and for GHG emission factor assumptions
( ) denotes reduction

Table 18
Existing State Measures For Greenhouse Gas Emissions Reductions

Measure	Sector	% Reduction from Business-As-Usual Scenario (Sector Specific)[1]	Total CO_2E from Business-As-Usual Scenario Sector[2]	Reduction in Annual Emissions (MT CO_2E)
Renewable Portfolio Standard (33% by 2020)	Energy Use (Electricity)	15.30%	12,230	(1,871)
Renewable Electricity Standard	Energy Use (Electricity)	14.25%	12,230	(1,743)
2013 Title 24 Energy Code Requirements	Energy Use (Natural Gas and Electricity)	15%	15,401	(2,310)
Assembly Bill 1493: Pavley I & II	Transportation	14.06%	61,607	(8,662)
Medium/Heavy Duty Vehicles (Aerodynamic Efficiency and Vehicle Hybridization)	Transportation	0.62%	61,607	(382)
Regional Transportation Related GHG Targets (SB 375)	Transportation	3.75%	61,607	(2,310)
Vehicle Efficiency Measures	Transportation	5.625%	61,607	(3,465)
			State Measure Reduction	**(20,743)**
			Total Emissions from Project with Existing State Measures to Reduce GHG Emissions	**87,367 MT CO_2E**
			Percent Reduction from Total Business As Usual Emissions	**23.7%**

[1] Percent reduction from business as usual calculated based on the ARB Scoping Plan reductions for sector-specific activity. ARB Scoping Plan, December 2008.

[2] Emissions from individual sectors as listed in Table 14: Combined Annual Emissions of Greenhouse Gases Business As Usual Scenario.

( ) denotes reduction

Table 19
Total Reduction of Greenhouse Gases

Business-As-Usual Total GHG from Focused Plan Amendment	87,367 metric tons CO_2E
Combined Reductions from Project Design Features and State Measures	(38,648 metric tons CO_2E)
Project Total	48,719 metric tons CO_2E
% Reduction from Business-As-Usual	**44.2%**

Consistency with Applicable Mitigation Strategies

As mentioned previously, the City's CPAP, adopted in 2005, aims to achieve at least a 15% reduction in CO_2 emissions through energy efficiency, renewable energy, and cleaner fuels. Specifically, the plan identifies a set of actions that will reduce emissions from City operations. The CPAP does not include specific strategies for the community or for projects within the City to reduce emissions. As the Focused Plan Amendment does not involve City operations, it would not conflict with the CPAP.

The City is currently in the process of developing a Climate Action Plan (CAP). The CAP would identify strategies and measures to meet GHG reduction targets. The draft CAP includes four categories of strategies to reduce GHG sources: energy & water efficient buildings, clean & renewable energy, multimodal transportation options, zero waste management, and urban forest & local food production. The Focused Plan Amendment would accommodate mixed-use, transit oriented development that includes energy efficiency and waste reduction features. Therefore, the project would be generally consistent with the draft CAP.

Table 20 shows the proposed Amendment's consistency with the City San Diego General Plan's Climate Change and Sustainable Policies (2008). As discussed above, the proposed Amendment would incorporate a number of design features intended to reduce GHG emissions.

Table 20
Amendment Consistency with Applicable
San Diego General Plan Climate Change and Sustainable Policies

Policy	Project Consistency
Conservation Element	
CE-A.2 Reduce the City's carbon footprint. Develop and adopt new or amended regulations, programs, and incentives as appropriate to implement the goals and policies set forth in the General Plan to: • Create sustainable and efficient land use patterns to reduce vehicular trips and preserve open space; • Reduce fuel emission levels by encouraging alternative modes of transportation and increasing fuel efficiency; • Improve energy efficiency, especially in the transportation sector and buildings and appliances; • Reduce the Urban Heat Island effect through sustainable design and building practices, as well as planting trees (consistent with habitat and water conservation policies) for their many environmental benefits, including natural carbon sequestration; • Reduce waste by improving management and recycling programs; • Plan for water supply and emergency reserves.	**Consistent** The proposed Focused Plan Amendment would facilitate mixed-use, urban infill and transit-oriented development. Subarea A is located in proximity to existing transit corridors and transit services. The project area is located near the Grantville Light Rail Trolley Station, would be a mixed-use development that would include commercial uses, and would emphasize pedestrian orientation. The project would therefore promote alternative transportation and would reduce overall vehicle travel by encouraging the use of public transit, bicycling and walking. Development would adhere to current Title 24 California Building Code standards for energy efficiency. Development in Subarea A would be required to divert at least 50% of its solid waste thereby reducing waste by improving management and recycling programs. Development in Subarea A would also be subject to all applicable State and City requirements for solid waste reduction as they change in the future.
CE-A.5. Employ sustainable or "green" building techniques for the construction and operation of buildings. a. Develop and implement sustainable building standards for new and significant remodels of residential and commercial buildings to maximize energy efficiency, and to achieve overall net zero energy consumption by 2020 for new residential buildings and 2030 for new commercial buildings. This can be accomplished through factors including, but not limited to: o Designing mechanical and electrical systems that achieve greater energy efficiency with currently available technology; o Minimizing energy use through innovative site design and building orientation that addresses factors such as sun-shade patterns, prevailing winds, landscape, and sun-screens; o Employing self generation of energy using renewable technologies; o Combining energy efficient measures that have longer payback periods with measures that have shorter payback periods; o Reducing levels of non-essential lighting, heating and cooling; and o Using energy efficient appliances and lighting.	**Consistent** Development would adhere to current Title 24 California Building Code standards for energy efficiency.

Table 20
Amendment Consistency with Applicable
San Diego General Plan Climate Change and Sustainable Policies

Policy	Project Consistency
b. Provide technical services for “green” buildings in partnership with other agencies and organizations.	
CE-A.9. Reuse building materials, use materials that have recycled content, or use materials that are derived from sustainable or rapidly renewable sources to the extent possible, through factors including: Scheduling time for deconstruction and recycling activities to take place during project demolition and construction phases; Using life cycle costing in decision-making for materials and construction techniques. Life cycle costing analyzes the costs and benefits over the life of a particular product, technology, or system; Removing code obstacles to using recycled materials in buildings and for construction; and Implementing effective economic incentives to recycle construction and demolition debris.	**Consistent** Development in the plan area would be required to divert at least 50% of its solid waste in compliance with AB 939.
CE-A.11. Implement sustainable landscape design and maintenance. a. Use integrated pest management techniques, where feasible, to delay, reduce, or eliminate dependence on the use of pesticides, herbicides, and synthetic fertilizers. b. Encourage composting efforts through education, incentives, and other activities. c. Decrease the amount of impervious surfaces in developments, especially where public places, plazas and amenities are proposed to serve as recreation opportunities d. Strategically plant deciduous shade trees, evergreen trees, and drought tolerant native vegetation, as appropriate, to contribute to sustainable development goals. e. Reduce use of lawn types that require high levels of irrigation. f. Strive to incorporate existing mature trees and native vegetation into site designs. g. Minimize the use of landscape equipment powered by fossil fuels. h. Implement water conservation measures in site/building design and landscaping. i. Encourage the use of high efficiency irrigation technology, and recycled site water to reduce the use of potable water for irrigation. Use recycled water to meet the needs of development projects to the maximum extent feasible.	**Consistent** As required by the City’s Municipal Code (Section 147.0301) development would be equipped with ultra low-water use plumbing fixtures, reducing water use at the project site.

Table 20
Amendment Consistency with Applicable
San Diego General Plan Climate Change and Sustainable Policies

Policy	Project Consistency
CE-A.12. Reduce the San Diego Urban Heat Island, through actions such as: • Using cool roofing materials, such as reflective, low heat retention tiles, membranes and coatings, or vegetated eco-roofs to reduce heat build-up; • Planting trees and other vegetation, to provide shade and cool air temperatures. In particular, properly position trees to shade buildings, air conditioning units, and parking lots; and • Reducing heat build up in parking lots through increased shading or use of cool paving materials as feasible.	**Consistent** Development projects within Subarea A would be required to landscape in accordance with San Diego Municipal Code landscaping regulations.
CE-F.2. Continue to upgrade energy conservation in City buildings and support community outreach efforts to achieve similar goals in the community.	**Consistent** Development would adhere to current Title 24 California Building Code standards for energy efficiency.
CE-F.4. Preserve and plant trees, and vegetation that are consistent with habitat and water conservation policies and that absorb carbon dioxide and pollutants.	**Consistent** As required by the City's Municipal Code (Section 147.0301) development would be equipped with ultra low-water use plumbing fixtures, reducing water use in Subarea A.
CE-F.6. Encourage and provide incentives for the use of alternatives to single-occupancy vehicle use, including using public transit, carpooling, vanpooling, teleworking, bicycling, and walking. Continue to implement programs to provide City employees with incentives for the use of alternatives to single-occupancy vehicles.	**Consistent** The project would be a mixed-use, urban infill and transit-oriented development project. The project site is located in proximity to existing transit corridors and transit services. Subarea A is located near the Grantville Light Rail Trolley Station and would include mixed-use development that would include commercial uses, and would emphasize pedestrian orientation. The Amendment would therefore promote alternative transportation and would reduce overall vehicle travel by encouraging the use of public transit, bicycling and walking.
CE-I.7. Pursue investments in energy efficiency and direct sustained efforts towards eliminating inefficient energy use.	**Consistent** Development would adhere to current Title 24 California Building Code standards for energy efficiency.

Table 20
Amendment Consistency with Applicable
San Diego General Plan Climate Change and Sustainable Policies

Policy	Project Consistency
CE-J.1. Develop, nurture, and protect a sustainable urban/community forest. a. Seek resources and take actions needed to plant, care for, and protect trees in the public right-of-way and parks and those of significant importance in our communities. b. Plant large canopy shade trees, where appropriate and with consideration of habitat and water conservation goals, in order to maximize environmental benefits. c. Seek to retain significant and mature trees. d. Provide forest linkages to connect and enhance public parks, plazas, recreation and open space areas.	**Consistent** Development projects within the Subarea A would be required to landscape in accordance with San Diego Municipal Code landscaping regulations.
CE-J.4. Continue to require the planting of trees through the development permit process. a. Consider tree planting as mitigation for air pollution emissions, storm water runoff, and other environmental impacts as appropriate.	**Consistent** Development projects within Subarea A would be required to landscape in accordance with San Diego Municipal Code landscaping regulations.
Mobility Element	
ME-F.5. Increase the number of bicycle-transit trips by coordinating with transit agencies to provide safe routes to transit stops and stations, to provide secure bicycle parking facilities, and to accommodate bicycles on transit vehicles.	**Consistent** The Focused Plan Amendment would facilitate mixed-use, urban infill and transit-oriented development. Subarea A is located in proximity to existing transit corridors and transit services. Subarea A is located near the Grantville Light Rail Trolley Station and would include mixed-use development that would include commercial uses, and would emphasize pedestrian orientation. The Amendment would therefore promote alternative transportation and would reduce overall vehicle travel by encouraging the use of public transit, bicycling and walking.
ME-E.6. Require new development to have site designs and on-site amenities that support alternative modes of transportation. Emphasize pedestrian and bicycle-friendly design, accessibility to transit, and provision of amenities that are supportive and conducive to implementing TDM strategies such as car sharing vehicles and parking spaces, bike lockers, preferred rideshare parking, showers and lockers, on-site food service, and child care, where appropriate.	**Consistent** The Focused Plan Amendment would facilitate mixed-use, urban infill and transit-oriented development. Subarea A is located in proximity to existing transit corridors and transit services. Subarea A is located near the Grantville Light Rail Trolley Station and would include mixed-use development that would include commercial uses, and would emphasize pedestrian orientation. The Amendment would therefore promote alternative transportation and would reduce overall vehicle travel by encouraging the use of public transit, bicycling and walking.

In addition to the above policies from the General Plan, the OPR CEQA Guidelines (Appendix F) include recommended mitigation strategies to reduce energy use. According to this document, mitigation measures may include:

1. *Potential measures to reduce wasteful, inefficient and unnecessary consumption of energy during construction, operation, maintenance and/or removal.*
2. *The potential of siting, orientation, and design to minimize energy consumption, including transportation energy, water conservation and solid-waste reduction.*
3. *The potential for reducing peak energy demand.*
4. *Alternative fuels (particularly renewable ones) or energy systems.*
5. *Energy conservation which could result from recycling efforts.*

As discussed above, the Focused Plan Amendment would not require mitigation measures as it already incorporates a number of design features that would reduce GHG emissions by more than 28.3% over BAU. Project area development would be located in proximity to existing public transportation. It would also minimize energy consumption, including transportation energy, water conservation and solid-waste reduction through siting, orientation, and design. Therefore, the Focused Plan Amendment would promote land use alterations that limit air emissions and reduce wasteful, inefficient and unnecessary energy consumption. In addition, individual project area developments would be required through permit conditions to be designed to comply with requirements of Part 6, Title 24 of the California Building Standards Code – California Energy Code. San Diego's solid waste diversion rate was 55% in 2006. It is anticipated that individual project area developments would implement a recycling service during construction and operation of the project and would be in compliance with AB 939, diverting at least 50% of its solid waste. Further, the project would be consistent with the Climate Change and Sustainable Policies in the City's General Plan as discussed in Table 18, as well as with OPR strategies referenced above. Therefore, the project would be consistent with applicable GHG reduction plans, policies and regulations including the objectives of AB 32, SB 97, and SB 375. Impacts related to climate change would not be significant.

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Appendix A

CalEEMod Air Quality and Greenhouse Gas Emissions Model Results –
(Summer/Annual Existing Uses, Summer/Annual Proposed Project,
Summer Hypothetical Project)
N_2O from Mobile Emissions Sources

Appendix B

Carbon Monoxide Modeling Results