4.2 AIR QUALITY

This section includes a description of applicable air quality regulations and existing air quality conditions, and an analysis of potential short-term and long-term air quality impacts associated with implementation of Alternatives 1 through 5. Mitigation measures are recommended, as necessary, to reduce potentially significant adverse air quality impacts.

4.2.1 REGULATORY BACKGROUND

The project site is located in Douglas County, Nevada, which is within the Lake Tahoe Air Basin (LTAB). Air quality within the Douglas County portion of the LTAB is regulated by such agencies as the U.S. Environmental Protection Agency (EPA), the Tahoe Regional Planning Agency (TRPA), and the State of Nevada Division of Environmental Protection (NDEP) Bureau of Air Pollution Control (BAPC) and Bureau of Air Quality Planning (BAQP). Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, state and local regulations may be more stringent.

Air quality regulations focus on the following air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable and fine particulate matter (PM_{10} and $PM_{2.5}$), and lead. Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, they are commonly referred to as "criteria air pollutants."

FEDERAL

At the federal level, EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

The CAA required EPA to establish national ambient air quality standards (NAAQS). As shown in Table 4.2.1, EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA must review all state SIPs to determine whether they conform to the mandates of the CAA and the amendments thereof, and to determine whether implementing them will achieve air quality goals. If EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) that imposes additional control measures may be prepared for the nonattainment area. Failure to submit an approvable SIP or to implement the plan within the mandated time frame may cause sanctions to be applied to transportation funding and stationary air pollution sources in the air basin.

In addition, general conformity requirements were adopted by Congress as part of the CAAA and were implemented by EPA regulations in 1993. General conformity requires that all federal actions conform to the SIP as approved or promulgated by EPA. The purpose of the general conformity program is to ensure that actions taken by the federal government do not undermine state or local efforts to achieve and maintain NAAQS. Before a federal action is taken, it must be evaluated for conformity with the SIP. All reasonably foreseeable emissions, both direct and indirect, that are predicted to result from the action are taken into consideration. The location and quantity of emissions must be identified. If it is found that the action would create emissions above de minimis threshold levels specified in EPA regulations, or if the activity is considered regionally significant because its emissions exceed 10% of an area's total emissions, the action cannot proceed unless mitigation measures are specified that would bring the project into conformance.

Table 4.2-1
Ambient Air Quality Standards

Pollutant	Averaging Time	TRPA	Nevada[2, 5]	National[1]	
				Primary [2,3]	Secondary [2,4]
Ozone	1-hour	0.08 ppm	0.10 ppm[6] (195 µg/m^3)	-[7]	Same as Primary Standard
	8-hour	–	–	0.075 ppm (144 µg/m^3)	
Carbon Monoxide (CO)	1-hour	–	35 ppm (40 mg/m^3)	35 ppm (40 mg/m^3)	Same as Primary Standard
	8-hour	6 ppm	6 ppm[8] (7 mg/m^3)	9 ppm (10 mg/m^3)	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	–	0.053 ppm (100 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary Standard
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	0.030 ppm (80 µg/m^3)	0.030 ppm (80 µg/m^3)	–
	24-hour	–	0.14 ppm (365 µg/m^3)	0.14 ppm (365 µg/m^3)	–
	3-hour	–	0.5 ppm (1300 µg/m^3)	–	0.5 ppm (1300 µg/m^3)
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	–	50 µg/m^3	-[10]	Same as Primary Standard
	24-hour		150 µg/m^3	150 µg/m^3	
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	–	–	15 µg/m^3	Same as Primary Standard
	24-hour	–	–	35 µg/m^3	

Table 4.2-1
Ambient Air Quality Standards

Pollutant	Averaging Time	TRPA	Nevada[2, 5]	National[1]	
				Primary [2,3]	Secondary [2,4]
Lead	Calendar Quarter	–	1.5 µg/m^3	1.5 µg/m^3	Same as Primary Standard
Hydrogen Sulfide	1-hour	–	0.08 ppm[9] (112 µg/m^3)	No National Standards	
Visibility-Reducing Particle Matter	-	Regional: 25 Mm-1 (157 km, 97 miles) 50% of the year, 34 Mm-1 (115 km, 71 miles) 90% of the year. Subregional: 50 Mm-1 (31 km, 19 miles) 90% of the year, 125 Mm-1 (31 km, 19 miles) 50% of the year.	–		

[1] National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

[2] Concentration expressed first in units in which it was issued. Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[3] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[4] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[5] The Director shall use the Nevada standards in considering whether to issue a permit for a stationary source and shall ensure that the stationary source will not cause the Nevada standards to be exceeded in areas where the general public has access.

[6] For the LTAB.

[7] The 1-hour ozone NAAQS was revoked on June 15, 2005.

[8] At or greater than 5,000' above mean sea level.

[9] The ambient air quality standard for hydrogen sulfide does not include naturally occurring background concentrations.

[10] Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, EPA revoked the annual PM_{10} standard on September 21, 2006.

Sources : TRPA 2002; EPA 2006a ; NAC 2006

EPA also has programs for identifying and regulating hazardous air pollutants (HAPs). In general, for those HAPs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the criteria air pollutants, for which acceptable levels of exposure can be determined and for which the ambient standards have been established (Table 4.2-1).

Title III of the CAAA directed EPA to promulgate national emissions standards for HAPs (NESHAP). The NESHAP may differ for major sources and area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources. The CAAA called on EPA to promulgate emissions standards in two phases. In the first phase (1992–2000), EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring maximum available control technology (MACT) for HAPs. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), EPA is required to promulgate health risk–based emissions standards where deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA also required EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum for benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 of the CAAA required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

TAHOE REGIONAL PLANNING AGENCY

At the regional level, the TRPA has adopted the following:

Environmental Threshold Carrying Capacities

The TRPA has adopted Environmental Threshold Carrying Capacities (ETCC) in compliance with the requirements of the TRPA Compact to maintain the natural value of the LTAB and public safety in the region. The current ETCC thresholds are as follows:

Carbon Monoxide

- Numerical Standard: Maintain carbon monoxide concentrations at or below 6.0 parts per million (ppm) averaged over 8 hours.
- Management Standard: Reduce average daily traffic volume between 4:00 p.m. and 12:00 midnight on the U.S. Highway 50 (U.S. 50) corridor by 7% during the months of November through February from the 1981 base year.

Ozone

- Numerical Standard: Maintain ozone concentration below 0.08 ppm averaged over 1 hour.

Regional Visibility

- Numerical Standard: Achieve 156 kilometers (97 miles) at least 50% of the year as measured by aerosol concentrations measured at Bliss State Park monitoring site.
- Numerical Standard: Achieve 115 kilometers (71 miles) at least 90% of the year as measured by aerosol concentrations measured at Bliss State Park monitoring site.

- Management Standard: Reduce wood smoke emissions by 15% of the 1981 base values through technology, management practices, and educational programs.

Subregional Visibility

- Numerical Standard: Achieve 78 kilometers (48 miles) at least 50% of the year as measured by particulate concentrations measured at the South Lake Tahoe monitoring site.
- Numerical Standard: Achieve 31 kilometers (19 miles) at least 90% of the year as measured by particulate concentrations measured at the South Lake Tahoe monitoring site.
- Management Standard: Reduce suspended soil particles by 30% of the 1981 base values through technology, management practices, and educational programs.
- Management Standard: Reduce wood smoke emissions by 15% of the 1981 base values through technology, management practices, and educational programs.
- Management Standard: Reduce vehicle miles of travel by 10% of the 1981 base values.

Atmospheric Deposition

- Water Quality (WQ) Numerical Standard: Reduce dissolved inorganic nitrogen loading to Lake Tahoe from all sources by 25% of the 1973–1981 annual average.
- Management Standard: Reduce dissolved inorganic nitrogen loads from surface runoff by approximately 50%, from groundwater approximately 30%, and from atmospheric sources approximately 20% of the 1973–1981 annual average. This threshold relies on predicted reductions in pollutant loadings from out-of-Basin sources as part of the total pollutant loading reduction.
- Management Standard: Reduce the transport of nitrates into the LTAB and reduce oxides of nitrogen produced in the LTAB consistent with water quality thresholds.
- Management Standard: Reduce vehicles miles of travel in the Lake Tahoe Basin by 10% of the 1981 base year values.

TRPA has also adopted the Regional Transportation Plan-Air Quality Plan for the Lake Tahoe Region to attain and maintain the Environmental Threshold Carrying Capacities. A review of the Environmental Threshold Carrying Capacities thresholds was performed in 2001, and the 2001 Threshold Evaluation Report was published in 2002 (TRPA 2002). A subsequent Draft 2006 Threshold Evaluation Report was released for public comment in April 2006. At the time of publication of this document, this Draft 2006 Threshold Evaluation Report (TRPA 2007) has not been adopted by TRPA.

Code of Ordinances

TRPA adopted Chapter 91 (Air Quality Control) and Chapter 93 (Traffic and Air Quality Mitigation Program) of the TRPA Code of Ordinances. The applicable provisions of these chapters are described below.

Chapter 91 Air Quality Control

The provisions of Chapter 91 apply to direct sources of air pollutions in the Tahoe Region, including certain motor vehicles registered in the region, combustion heaters installed in the region, open burning, stationary sources of air pollution, and idling combustion engines.

Section 91.2, Vehicle Inspection and Maintenance Program, states that to avoid duplication of effort in implementation of an inspection/maintenance program for certain vehicles registered in the CO non-attainment area, TRPA shall work with the affected state agencies to plan for the application of state inspection/maintenance programs to the Tahoe Region.

Section 91.3, Combustion Appliances, establishes emission standards for wood heaters, as well as natural gas or propane-fired water heaters and central furnaces.

Section 91.5.B states that any new stationary source of air pollution that produces emissions for the peak 24-hour period beyond any of the limits in Table II, reproduced as Table 4.2-2 below, shall be considered to have a significant adverse environmental impact. New stationary sources that have a significant adverse environmental impact shall be prohibited.

91.5.D Best Available Control Technology: Best Available Control Technology shall be required for all new stationary sources that are required to prepare an Environmental Assessment pursuant to Subsection 91.5.A, above. At a minimum, required BACT measures shall meet or exceed applicable state or federal requirements.

Table 4.2-2
TRPA Peak 24-hour Period Significance Thresholds

Pollutant	Kilograms	Pounds
Nitrogen Dioxide	11.0	24.2
PM_{10}	10.0	22.0
Volatile Organic Compounds (Reactive Organic Gases)	57.0	124.2
Sulfur Dioxide	6.0	13.2
Carbon Monoxide	100.0	220.5

Source: TRPA 2004

Chapter 93 Traffic and Air Quality Mitigation Program

The purpose of Chapter 93 is to establish fees and other procedures to offset impacts from indirect sources of air pollution. As part of the project application for additional development that would result in an increase of more than 200 daily vehicle trips, a technically adequate analysis of potential traffic and air quality impacts shall be prepared (Section 93.3.B)[a]. To offset regional and cumulative impacts, additional development shall contribute to the Air Quality Mitigation Fund. Instead of a contribution, additional development may provide mitigation measures, the cost of which shall be equal to, or greater than, the required contribution to the Air Quality Mitigation Fund (Section 93.3.C). In lieu of the contribution required under Section 93.3.C(1), additional development may provide mitigation measures, the cost of which measures shall be equal to, or greater than, the contribution required under Section 93.3.C(1). Such regional and cumulative mitigation measures may include Transportation Systems Management measures, including, but not limited to, bicycle facilities and pedestrian facilities. For new residential units, the required contribution would be $325.84 per daily vehicle trip (Section 93.3.D).

[a] The technical analysis of potential traffic and air quality impacts contained in Chapter 4.14 (Transportation and Circulation) includes the required analysis for traffic and air quality impacts of the proposed project and each of the alternatives studied

STATE

At the state level, the Nevada BAPC and BAQP are the agencies responsible for coordination and oversight of state air pollution control programs, including the Chemical Accident Prevention Program (CAPP), and air quality surveillance in Nevada, except for in Washoe and Clark Counties. The authority for the BAPC and BAQP to implement air pollution control programs is drawn from the Nevada Revised Statutes (NRS) 445B.100 through 445B.825 and 486A.010 through 486A.180. The agencies achieve and maintain air-quality conditions in Douglas County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air-quality issues. The clean-air strategy of the BAPC and BAQP include the preparation of plans and programs for the attainment of ambient-air-quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. The BAPC and BAQP also oversee compliance with Nevada and federal laws; prepare SIPs; conduct inspections; observe and review source test data, excess emission reports, and compliance certification reports; investigate air quality complaints; operate an ambient air quality monitoring network; develop and implement strategies to control air pollution from motor vehicles, convert motor vehicle fleets to use cleaner-burning alternative fuels; and coordinate and facilitate prescribed outdoor burning. In addition, as shown Table 4.2.1, the Nevada Administrative Code (NAC) 445B.22097 establishes the Nevada State ambient air quality standards (NSAAQS).

LOCAL

- At the local level, Douglas County has identified policies to maintain or improve existing air quality (Douglas County 1996). Except for issuance, enforcement, and oversight of building permits, site development permits, and other related construction matters, TRPA policies, codes, and regulations supersede those of Douglas County within the Tahoe Basin.

CRITERIA AIR POLLUTANTS

Concentrations of the following air pollutants: ozone, CO, NO_2, SO_2, PM_{10} and $PM_{2.5}$, and lead are used as indicators of ambient air quality conditions. Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, they are commonly referred to as "criteria air pollutants." A brief description of each criteria air pollutant including source types, health effects, and future trends is provided at the beginning of Appendix J.

5.7.2 AFFECTED ENVIRONMENT

The project site is located within the LTAB. The LTAB comprises portions of El Dorado and Placer counties on the California side; and Washoe County, Douglas County, and Carson City Rural District on the Nevada side. The ambient concentrations of air pollutant emissions are determined by the amount of emissions released by pollutant sources and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources, as discussed separately below.

TOPOGRAPHY, METEOROLOGY, AND CLIMATE

Lake Tahoe lies in a depression between the crests of the Sierra Nevada and Carson ranges on the California-Nevada border at a surface elevation of approximately 6,260 feet above sea level. The LTAB is defined by the 7,000-foot contour, which is continuous around the lake, except near Tahoe City. The mountains surrounding the lake are approximately 8,000 to 9,000 feet in height on average, with some reaching 10,000 feet.

The constant water temperature of Lake Tahoe, at 600 feet below the surface, is approximately 39ºF (4ºC). This characteristic in combination with the topographic location of the lake define one of the LTAB's most important

atmospheric regimes, that in the absence of strong synoptic weather systems, develop shallow subsidence and radiation inversions throughout the year. In addition, the rapid radiation cooling at night regularly generates gentle down-slope nocturnal winds draining from the mountain ridges down to the shore and then fanning across the lake (Cahill and Cliff 2000).

Pollutants from local sources are trapped by frequent inversions in the LTAB, greatly limiting the volume of air into which the pollutants are mixed (e.g., diluted) resulting in accumulation and elevated concentrations. Further, each night the down-slope winds transport local pollutants from nearby developed areas out over the lake, increasing the opportunity for pollutants to deposit. This meteorological regime, characterized by weak or calm winds and a strong inversion, is the most common pattern at all times of the year (Cahill and Cliff 2000).

A second important meteorological regime is the transport of pollutants from the Sacramento Valley and San Francisco Bay due to mountain upslope winds that result from the topographic location of the lake directly to the east of the Sierra Nevada crest. This pattern develops when the western slopes of the Sierra Nevada are heated, causing the air to rise in a chimney effect and move upslope to the Sierra crest and over into the LTAB. The strength of this pattern depends on the amount of heating, and thus is strongest in summer, beginning in April and essentially ceasing in late October (Cahill and Cliff 2000).

Other regimes in the LTAB are defined by strong synoptic weather patterns that overcome the dominant terrain-defined meteorology regimes discussed above. The most important is the winter storm regime, which is responsible for precipitation primarily in the form of snow (Cahill and Cliff 2000).

Each of the meteorological regimes has the potential to influence pollution concentrations in the LTAB. Pollution episodes typically occur when local inversions are present, which trap emissions and when conditions allow for the transport of pollution from the western slopes of the Sierra Nevada, the Sacramento Valley, and the San Francisco Bay. Recent studies have even shown spring and fall contributions to local pollution levels from Asia. Periods of low pollution concentration are associated with winter storms and high winds. Winter storms dilute the local and upwind pollution with strong vertical mixing and the incorporation of clean North Pacific air (Cahill and Cliff 2000).

Local meteorological conditions are recorded at the Stateline-Harrah's, Nevada Station for the project site. The annual normal precipitation is approximately 13 inches, which primarily occurs from November through March in the form of snowfall. January temperatures range from a normal minimum of 23ºF to a normal maximum of 42ºF. August temperatures range from a normal minimum of 48ºF to a normal maximum of 78ºF (WRCC 2006a). The annual predominant wind direction and mean speed is from the south at 7 mph (WRCC 2006b, 2006c).

MONITORING STATION DATA AND ATTAINMENT AREA DESIGNATIONS

Criteria air pollutant concentrations are measured at several monitoring stations in the LTAB. The South Lake Tahoe-Sandy Way and South Lake Tahoe–Airport Road stations are the closest monitoring stations to the project site with recent data for ozone, CO, NO_2, $PM_{10,}$ and $PM_{2.5}$. In general, the ambient air quality measurements from these monitoring stations are representative of the air quality in the vicinity of the project site. Table 4.2-3 summarizes the air quality data from these stations for the past 3 years, 2003 through 2005. The national standards for ozone, CO, and NO_2 were not exceeded from 2003 to 2005. The State of Nevada standards for ozone, and CO were not exceeded from 2003 to 2005. The State of Nevada standards for NO_2 were exceeded in 2003.TRPA standards for ozone were not exceeded in 2003, 2004 and 2005. TRPA standards for CO were exceeded in 2003 and 2004. TRPA standards for PM_{10} were exceeded in 2003. TRPA standards for NO_2, SO2, and $PM_{2.5}$ have not been established. The ambient air quality measurements from these two stations were well within the national standards for ozone, CO, and NO_2 from 2003 to 2005.

EPA and TRPA use this type of monitoring data to designate areas according to attainment status for criteria air pollutants established by the agencies. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are

nonattainment, attainment, and unclassified. Unclassified is used in areas that cannot be classified on the basis of available information as meeting or not meeting the standards. The most current national and TRPA attainment designations for the Douglas County portion of the LTAB are shown in Table 4.2-4 for each criteria air pollutant. Because the project site would not be located in a nonattainment or maintenance area with respect to the NAAQS, a conformity determination is not required for the Sierra Colina Village project.

Table 4.2-3
Summary of Annual Air Quality Data (2003-2005)[1]

South Lake Tahoe-Sandy Way And Airport Road Air Quality Monitoring Stations			
	2003	2004	2005
Ozone			
Maximum concentration (1-hr/8-hr, ppm)	0.075 / 0.066	0.066 / 0.058	0.073 / 0.067[2]
Number of days national standard exceeded (1-hr/8-hr)	0 / 0	0 / 0	0 / 0[2]
Carbon Monoxide (CO)			
Maximum concentration (1-hr/8-hr, ppm)	2.4 / 1.51	2.2 / 1.18	-
Number of days national standard exceeded (1-hr/8-hr)	0 / 0	0 / 0	-
Nitrogen Dioxide ($N0_2$)			
Maximum concentration (1-hr, ppm)	0.052	0.055	-
Annual Average (ppm)	0.010	-	-
Respirable Particulate Matter (PM_{10})			
Maximum Concentration ($\mu g/m^3$)	61.0	47.0	38.0
Number of days national standard exceeded (measured/ calculated[3])	0 / 0.0	0 / -	0 / -
Fine Particulate ($PM_{2.5}$)			
Maximum Concentration ($\mu g/m^3$)	21.0	20.0	-
Number of days national standard exceeded (measured[3])	0	0	-

[1] Where, μg/m3 = micrograms per cubic meter and ppm = parts per million.

[2] Data from South Lake Tahoe - 1901 Airport Road Station reported for 2005 1- and 8-hour ozone concentrations only.

[3] Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every 6 days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

Sources: ARB 2006; EPA 2006c

Table 4.2-4
Attainment Status Designations[1]

Pollutant	National Designation	TRPA Designation
Ozone - 1-hour	No applicable standard[2]	Nonattainment
Ozone - 8-hour	Attainment/Unclassified	Nonattainment
PM_{10}	Attainment/Unclassified	Nonattainment
$PM_{2.5}$	Attainment/Unclassified	—
Carbon Monoxide	Attainment/Unclassified	Nonattainment
Nitrogen Dioxide	Attainment/Unclassified	—
Sulfur Dioxide	Attainment/Unclassified	—

Table 4.2-4
Attainment Status Designations[1]

Pollutant	National Designation	TRPA Designation
Lead (Particulate)	Attainment/Unclassified	—
Hydrogen Sulfide	—	—
Sulfates	—	—
Visibility Reducing Particulates	—	Region: Attainment Subregion: Attainment
Traffic Volume	—	Unknown/Attainment[3]
Wood Smoke	—	Unknown (Likely Nonattainment)[3]
Vehicle Miles of Travel	—	Nonattainment
Atmospheric Deposition – TRPA Interim Target	—	Unknown[3]
Atmospheric Deposition - TRPA Standard	—	Unknown[3]

[1] For the Douglas County portion of the LTAB.
[2] The 1-hour ozone NAAQS was revoked on June 15, 2005.
[3] The status of these standards is unknown because the technology necessary to determine base year values does not exist, and the original standards and indicators were not well defined.
Sources: EPA 2006d, TRPA 2002, TRPA 2006

ATMOSPHERIC DEPOSITION

Lake Tahoe's clarity has been decreasing by approximately 1 foot per year for over 30 years (see Section 5.5, Hydrology and Water Quality, for more information). Clarity loss has historically been attributed to increased inputs of the nutrients nitrogen and phosphorous. These nutrients cause an increase in the growth of algae, which results in reduced clarity. Recent data indicate that particles in the water also have a significant impact to lake clarity, and possibly even more than algal growth. Data from the late 1970s and early 1980s found that nitrogen deposition from the atmosphere was contributing to the nutrient load in the lake. At that time, it was believed that excess nitrogen was having the largest impact on the loss of lake clarity. Therefore, TRPA adopted a threshold indicator for nitrogen deposition to the lake. However, data collected in the 1980s and 1990s indicated that phosphorous also plays a significant role in lake clarity, and in some years its role was equal to or more significant than nitrogen. Research published in 1994 found that phosphorous is also depositing from the air into the lake (Jassby et al. 1994). This has prompted further study into the role of atmospheric deposition, with data indicating that phosphorous loading to the lake must also be reduced if the loss of clarity is to be slowed and, hopefully, reversed. Although TRPA has not yet adopted indicators for deposition of phosphorous, it is expected that as the indicator update process gets underway, an indicator will be included for this nutrient. As discussed above, particle deposition to the lake is also important to clarity. However, it is not yet known if the current federal and state standards for PM are stringent enough to also address the role of PM in lake clarity loss. This is also being evaluated in the indicator update process.

4.2.3 ENVIRONMENTAL CONSEQUENCES AND RECOMMENDED MITIGATION MEASURES

CRITERIA OF SIGNIFICANCE

For the purpose of this analysis, the following thresholds of significance, as identified by TRPA, have been used to determine whether implementation of the proposed project would result in significant air quality impacts. Thus, the proposed project would result in significant air quality impacts if implementation would:

- conflict with or obstruct implementation of the applicable air quality plan;
- violate any air quality standard or contribute substantially to an existing or projected air quality violation (Refer to Table 4.2-1);
- result in a cumulatively considerable net increase of any criteria air pollutant for which the project region is in nonattainment under any applicable national or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- expose sensitive receptors to substantial pollutant concentrations (including HAPs);
- create objectionable odors affecting a substantial number or people;
- cause construction-generated or long-term operational (regional) emissions of ROG, NO_X, or PM_{10} to exceed mass emissions of 82 lb/day [Note: Although mass emissions thresholds have not been adopted by the state of Nevada, Nevada BAPC and BAQP, or Douglas County, a threshold of 82 lb/day (used by other Tahoe Basin jurisdictions) is appropriate to determine whether project implementation would exceed TRPA's numerical thresholds and/or affect related- attainment designations (e.g., atmospheric deposition)];
- long-term operation-related (e.g., regional and local) emissions exceed numerical standards or ETCC thresholds for any jurisdiction;
- construction-related emissions exceed NAC 445B.7665 (Heavy-duty Equipment Opacity), NAC 445B.22017 (Visible Emissions), or NAC 445B.22037 (PM Emissions-Fugitive Dust) standards; or
- stationary-source emissions exceed TRPA's peak 24-hour period significance thresholds established by Chapter 91 of the Code of Ordinances (Table 4.2-2).

In addition, the required and/or in lieu contribution to the Air Quality Mitigation Fund to offset regional and cumulative impacts for new residential units, pursuant to TRPA Code of (Sections 93.3.C and 93.3.D), is discussed in Chapter 4.14, Transportation and Circulation, because it is a direct function of the number of daily vehicle trips generated by the project and does not concern emissions from stationary and area sources.

Alternative 1 – Proposed Project

IMPACT 4.2.1-1 **Generation of Short-Term Construction-Related Emissions of Criteria Air Pollutants and Precursors.** Absent *TRPA-recommended mitigation measures, construction-related emissions of criteria air pollutants and precursors under Alternative 1 could contribute substantially to an existing or projected air quality violation and expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to TRPA standards. This would be a* ***significant*** *impact.*

Construction emissions are described as "short-term" or temporary in duration and have the potential to represent a significant impact with respect to air quality. Fugitive PM_{10} dust emissions are primarily associated with site

preparation and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and VMT by construction vehicles on- and off-site. Ozone precursor emissions of ROG and NO_X emissions are primarily associated with gas and diesel equipment exhaust and the application of architectural coatings.

Under Alternative 1, the initial site preparation and building phases of construction would result in the temporary generation of criteria air pollutant (e.g., PM_{10}) and precursor emissions (e.g., ROG and NO_X) from site preparation (e.g., excavation, grading, and clearing); off-road equipment, material import/export, and worker commute exhaust emissions; paving; application of architectural coatings.

Short-term construction-related emissions of ROG, NO_X, and PM_{10} under Alternative 1 were modeled using the ARB-approved URBEMIS 2002 Version 8.7 computer program and EMFAC 2002 emission factors as recommended by TRPA. URBEMIS is designed to model construction emissions for land use development projects and allows for the input of project-specific information. Input parameters were based on default model settings and information provided in the Project Description. Construction of the proposed project is anticipated to be carried out in three phases. The first phase is anticipated to begin in May of 2009, with final project completion in 2012. Modeling assumed a construction period of 2008 through 2011 and used 2008 emission factors. Emissions generated by construction trips beyond 2008 would likely be the same or lower because emissions standards are generally more stringent with time.[b] The modeled maximum daily construction-related emissions are summarized in Table 4.2-5 and described in more detail below and in Appendix J.

Table 4.2-5
Summary of Modeled Worst-Case Daily Short-Term Construction-Related Emissions under Alternative 1[1]

Source	ROG (lb/day)	NO_X (lb/day)	PM_{10} (lb/day)
Site Grading and Underground Utility Work (May 2009)[1]			
Fugitive Dust	-	-	26.69
Off-Road Diesel	3.30	20.02	0.68
On-Road Diesel	0.03	0.48	0.01
Worker Trips	0.02	0.02	0.00
Maximum Daily Total, Unmitigated	3.35	20.52	27.38
Building Construction (Summer 2009-Fall 2012)[2]			
Building Construction[3]			
Off-Road Diesel	5.42	33.17	1.11
Worker Trips	0.17	0.10	0.01
Asphalt Paving[4]			
Off-Gas	0.10	-	-
Off-Road Diesel	1.68	9.74	0.27
On-Road Diesel	0.01	0.18	0.00
Worker Trips	0.01	0.01	0.00
Architectural Coatings[5]			
Off-Gas	4.49	-	-
Worker Trips	0.17	0.10	0.01
Maximum Daily Total, Unmitigated	12.05	43.30	1.40

[b] If the start of construction is delayed beyond May 2009, emission generated from construction trips thereafter would be the same or lower than those modeled herein.

Table 4.2-5
Summary of Modeled Worst-Case Daily Short-Term Construction-Related Emissions under Alternative 1[1]

[1] On-site mobile equipment emissions for site grading were based on default emission factors and time durations of URBEMIS2002 Version 8.7.0. Construction activities that involve soil disturbance must occur between May 1 and October 15 to comply with TRPA Code Section 62.4.A unless special approval has been granted by TRPA.

[2] All building construction would begin after the completion of site grading and underground utility work. These activities could be performed during winter months, weather permitting, and are assumed to consist of work days not longer than 10.5 hours. Employee off-site vehicle trip emissions for the building construction phase were based on 30 workers per day. Though construction is projected to begin in 2009, the emission estimates shown are based on emission factors for the year 2008. Emissions generated by worker trips would be the same or lower in years beyond 2008 because of expected lower emission rates for mobile sources due to more stringent emissions standards and assumed vehicle turnover. The difference is nominal, however.

[3] Emissions generated by building construction were based on default emission factors and time durations of URBEMIS2002, except an emission factor of 0.0013 pounds per square foot surface area was used for architectural coatings emissions to reflect the expected use of low VOC content architectural coatings.

[4] Asphalt emissions are based on default emission factors and time duration of URBEMIS2002 to pave a total of 1.35 acres of area.

[5] Emissions from the application of architectural coatings are based on low VOC content architectural coatings emission factors and time duration of URBEMIS2002.

See Appendix J for modeling results.

Source: Modeling performed by EDAW 2007.

Based on the modeling conducted, construction of Alternative 1 would result in worst-case maximum unmitigated daily emissions of approximately 12 lb/day of ROG, 43 lb/day of NO_X, and 27 lb/day of PM_{10} (Table 4.2-5). Daily unmitigated construction-related emissions would not exceed the significance threshold of 82 lb/day for NO_X. Before compliance with TRPA-recommended mitigation measures, construction-related emissions under Alternative 1, specifically PM_{10}, could violate or contribute substantially to an existing or projected air quality violation and expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to the TRPA standards (e.g., 1-hour ozone and visibility-reducing particulate standards). As a result, this would be a **significant** impact.

Mitigation Measure 4.2.1-1. Reduce the Generation of Construction-Related Emissions of ROG, NO_X, and PM_{10}. In accordance with the TRPA Code of Ordinances and Douglas County requirements, the applicant shall implement the following mitigation measures during construction of the proposed project:

- The applicant shall obtain all necessary TRPA permits and approvals and shall follow all required TRPA codes and procedures with respect to BMPs, grading and excavation for the proposed project and all construction related and emissions generating activities.

- The applicant shall obtain all necessary Douglas County permits and approvals and shall follow all required County laws and procedures with respect to BMPs, grading and excavation for the proposed project and all construction related and emissions generating activities.

- Construction of the project shall comply with all applicable TRPA, BAQP, and BAPC codes, specifically TRPA Code of Ordinances Chapter 25 (Best Management Practices), Chapter 64 (Grading Standards), and Chapter 91 (Air Quality Control).

- Construction of the project shall comply with all applicable Douglas County codes, specifically including BMPs, grading and excavation for the proposed project and all construction related and emissions generating activities.

- The applicant shall require its contractors and suppliers, its general contractor and all of the general contractor's subcontractors and suppliers to comply with all of the terms and conditions of all project permits, approvals and conditions attached thereto, including all TRPA and Douglas County permits and approvals.

- Activities disturbing the soil shall not occur between October 15 and May 1 of each year, unless approval has been granted by TRPA. Prior to October 15, all construction sites shall be winterized per the provisions of Chapter 64.2.D of the TRPA Code of Ordinances.

- Dust control measures shall be required for any grading activity creating substantial quantities of dust. Dust control measures shall be approved by TRPA prior to groundbreaking and shall comply with the provisions of Chapter 64.4 of the TRPA Code of Ordinances.

Implementation of Mitigation Measure 4.2.1-1 would reduce fugitive PM_{10} dust emissions a minimum of approximately 75% and prevent dispersion, thereof, beyond the property boundary. Implementation of Mitigation Measure 4.2.1-1 would also reduce diesel equipment exhaust emissions of ROG, NO_X, and PM_{10} a minimum of 5%, 20%, and 45%, respectively. Implementation of Mitigation Measure 4.2.1-1 would reduce Impact 4.2.1-1 to a **less-than-significant** level.

IMPACT 4.2.1-2 Generation of Long-Term Operation-Related (Regional) Emissions of Criteria Air Pollutants and Precursors. *Long-term operation-related emissions would not exceed TRPA's stationary source thresholds or the recommended mass emissions threshold for NO_X. Therefore, implementation of Alternative 1 would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. This would be a* ***less-than-significant*** *impact.*

Regional stationary-, area- and mobile-source emissions of ROG, NO_X, PM_{10}, CO, and SO_X associated with implementation of the proposed project were estimated using URBEMIS 2002 Version 8.7.0 computer program, which is designed to model emissions for land use development projects. URBEMIS allows land use selections that include project location specifics and trip generation rates. URBEMIS accounts for stationary- and area-source emissions from the usage of natural gas, wood stoves, fireplaces, landscape maintenance equipment, and consumer products; and mobile-source emissions associated with vehicle trips. Regional stationary-, area-, and mobile-source emissions were estimated based on proposed land use types and sizes identified in the Project Description (e.g., 50 residential units), the net increase in trip generation from the transportation analysis prepared for this project in Section 4.14, Transportation and Circulation (e.g., 475 daily vehicle trips), and default model setting for 2010 conditions[c]. The residential units would be equipped with natural gas fireplaces. Project-related stationary sources (e.g., natural gas fired water heaters and central furnaces) would comply with Section 91.3 of the TRPA Code of Ordinances. Implementation of Alternative 1 would not include the construction or operation of any major stationary sources of emissions.

The modeled maximum daily operational emissions under Alternative 1 are summarized in Table 4.2-6 and described in more detail below and in Appendix J. Note, that estimates are conservative, and actual emissions of Alternative 1 could be less over time due to the energy saving features associated with LEED certified sustainable homes.

[c] The year 2010 was selected as the best representative year for project operation because initial phase(s) of the project would be constructed and occupied by that year. Model default settings for subsequent years would use emission factors and fleet mix assumptions that may result in nominally lower emissions. Therefore, this analysis may be considered reasonably conservative, but representative, should the completion of the construction and occupancy of the first phase of the project occur after the year 2010.

Table 4.2-6
Summary of Modeled Long-Term Operation-Related Emissions under Alternative 1

Source-Type	Project-Generated Emissions (pounds per day)				
	ROG	NO_X	PM_{10}	CO	SO_X
Summer					
Stationary Sources [1]	0.05	0.63	0.00	0.27	0.00
Area sources [2]	2.75	0.03	0.00	1.53	0.01
Mobile source [3]	2.39	3.11	2.69	26.70	0.02
Total	5.19	3.77	2.69	28.50	0.03
Winter					
Stationary Sources [1]	0.05	0.63	0.00	0.27	0.00
Area sources [2]	2.59	0.41	0.03	0.18	0.00
Mobile source [3]	2.76	3.72	2.69	32.55	0.02
Total	5.40	4.76	2.72	33.00	0.02
Thresholds					
Total emissions[4]	82.0	82.0	82.0	—	—
Stationary source emissions[5]	124.2	24.2	22.0	220.5	13.2

[1] Includes natural gas usage (e.g., from water heaters and central furnaces) and fireplaces. Does not account for possible emission reductions associated with proposed LEED certification.

[2] Area-source emissions include emissions from landscaping, application of architectural coatings, and consumer products, and are estimated based on default model settings, except an emission factor of 0.0013 pounds per square foot was used to reflect the project's use of low VOC content architectural coatings.

[3] Mobile-source emissions were estimated based on default model settings and trip generation rates and trip lengths obtained from the transportation analysis prepared for this project under buildout conditions for 2010.

[4] Total Emissions Threshold applies to the sum of stationary, area, and mobile sources for NO_X only.

[5] TRPA Thresholds apply to the stationary-source emissions only.

Source: Modeling performed by EDAW 2007

Based on the modeling conducted[d], project operations would result in worst-case maximum unmitigated daily emissions of approximately 5 lb/day of ROG, 5 lb/day of NO_X, 3 lb/day of PM_{10}, 33 lb/day of CO, and less than 1 lb/day of SO_X, which would not exceed any of the applicable thresholds as shown in Table 4.2-6. In addition, because the significance thresholds approximately correlate with reductions from heavy-duty vehicles and land use project emission reduction requirements in the SIP, project implementation would not conflict with any air quality planning efforts. Because the project's operational emissions of NO_X would not exceed the NO_X threshold, Alternative 1 would not affect TRPA's attainment designation for atmospheric deposition. Long-term operation-related emissions under Alternative 1 would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. This would be a **less-than-significant** impact.

Section 4.14, Transportation and Circulation, discusses contribution to the Air Quality Mitigation Fund, as required by Chapter 93.3.D of the TRPA Code of Ordinances, because the contribution amount is a direct function of the number of daily vehicle trips generated by the project, rather than the actual emissions from stationary, area, and mobile sources. TRPA may also evaluate whether bicycle and pedestrian facilities proposed under Alternative 1 constitute, under Section 93.3.C(2), mitigation measures that qualify for in lieu contribution credit against the monetary contribution required under Section 93.3.D.

[d] Modeling conducted for this analysis does not account for possible emission reductions associated with proposed LEED certification.

Mitigation Measures

No mitigation is required.

IMPACT 4.2.1-3 **Generation of Long-Term Operation-Related Local Mobile-Source Emissions of Carbon Monoxide.** *Long-term operation-related local mobile-source emissions of CO under Alternative 1 would not violate an air quality standard (i.e., 8-hour TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. This would be a* ***less-than-significant*** *impact.*

CO concentration is a direct function of motor vehicle activity (e.g., idling time and traffic flow conditions), particularly during peak commute hours, and meteorological conditions. Under specific meteorological conditions, CO concentrations may reach unhealthy levels with respect to local sensitive land-uses such as residential areas, schools, and hospitals. As a result, the analysis of CO emissions is at a local level.

The Transportation Project-Level Carbon Monoxide Protocol (Garza et al. 1997) states that signalized intersections that operate at an unacceptable levels of service (LOS) represent a potential for a CO violation, also known as a "hot spot", and thus undergo a quantitative screening-level analysis. TRPA's Goals and Policies indicate that up to four hours of LOS E conditions are acceptable at a signalized intersection. There is no TRPA standard for the operation of unsignalized intersections. Thus, an analysis of CO concentrations is typically recommended for receptors located near signalized intersections that are projected to operate at LOS E (for more than four hours per day) or F.

According to the transportation analysis (see Section 4.14, Transportation and Circulation, for additional detail), operation of Alternative 1 would not reduce the LOS at any signalized intersections to an unacceptable level (LOS E or F) during any time of the day or substantially worsen LOS at any signalized intersections (see Section 4.14, Transportation and Circulation, for additional detail). Thus, the generation of long-term operation-related local mobile-source emissions of CO under Alternative 1 would not violate an air quality standard (i.e., 8-hour TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. As a result, this would be a **less-than-significant** impact.

Mitigation Measures

No mitigation is required.

IMPACT 4.2.1-4 **Exposure of Sensitive Receptors to Odors.** *Neither project construction nor operation of Alternative 1 would create objectionable odors affecting a substantial number of people. This would be a* ***less-than-significant*** *impact.*

Implementation of Alternative 1 would not result in any major sources of odor and the proposed land use type is not one of the common types that are known to result in odor production (e.g., landfill, coffee roaster, wastewater treatment). Diesel exhaust from the use of on-site construction equipment would be intermittent and temporary, and would dissipate rapidly from the source. This would also be the case for any residents who occupy on-site units before construction of other buildings is complete. Also, because all of the initial site preparation would occur before any structures would be built and occupied; these on-site residents would not be present during most of the heavy-duty equipment operation. Thus, neither project construction nor operation of Alternative 1 would create objectionable odors affecting a substantial number of people. As a result, this would be a **less-than-significant** impact.

Mitigation Measures

No mitigation is required.

IMPACT 4.2.1-5 Exposure of Sensitive Receptors to Emissions of Hazardous Air Pollutants. *Neither construction nor operation of Alternative 1 would result in the exposure of sensitive receptors to substantial emissions of HAPs. As a result, this would be a* ***less-than-significant*** *impact.*

Construction of Alternative 1 would result in the generation of short-term construction-related emissions of diesel exhaust from the use of on-site heavy duty equipment. According to ARB, the potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential non-cancer health impacts.

In January 2001, EPA promulgated a Final Rule to reduce emission standards for 2007 and subsequent model year heavy-duty diesel engines. These emission standards represent a 90% reduction in NO_X, 72% reduction of non-methane hydrocarbon (NMHC) emissions, and 90% reduction of PM emissions in comparison to the 2004 model year emission standards.

More specifically, the dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to HAP emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to HAP emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project (Salinas, pers. comm., 2004). Thus, because the use of off-road heavy-duty diesel equipment would be temporary in combination with the highly dispersive properties of diesel PM (Zhu and Hinds 2002), and future reductions in exhaust emissions, project-generated construction-related emissions of Toxic Air Contaminants (TACs) would not result in the exposure of sensitive receptors to substantial emissions of HAPs.

The long-term operation of Alternative 1 would not include the construction or operation of any major stationary sources of HAP emissions, or result in the generation of on-site mobile-source emissions of HAPs (e.g., diesel truck traffic). In addition, there are no major existing sources of HAPs in the vicinity of the proposed project site. Nonetheless, all stationary sources having the potential to emit HAPs are required to obtain permits. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including specifically Chapter 91 (Air Quality Control) sections 91.5.C (Offsets Permitted) and 91.5.D (BACT). Given that compliance with applicable standards is required for the development and operation of facilities that may emit HAPs, emissions at the project site are expected to be within established standards. Thus, neither construction nor operation of Alternative 1 would result in the exposure of sensitive receptors to substantial emissions of HAPs. As a result, this would be a **less-than-significant** impact**.**

Mitigation Measures

No mitigation is required.

Alternative 2 – Grand Private Estate

IMPACT 4.2.2-1 Generation of Short-Term Construction-Related Emissions of Criteria Air Pollutants and Precursors. *Because construction of Alternative 2 would require the same types of equipment and construction period length, this impact would be similar to, but lower than Impact 4.2.1-1 described above for Alternative 1. Construction-related emissions of criteria air pollutants and precursors under Alternative 2 could contribute substantially to an existing or projected air quality violation and expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to TRPA standards. This would be a* ***significant*** *impact.*

This impact would be similar to Impact 4.2.1-1 described above for Alternative 1. See full discussion above.

Construction of Alternative 2 would require the same types of equipment and a construction period of two years, rather than three years under Alternative 1. The extent of development would be lower, with construction of a single-family grand estate with amenities, as compared to single- and multi-family residential uses, resulting in reduced generation of emissions as compared to Alternative 1. The modeled maximum daily construction emissions are summarized in Table 4.2-7 and described in more detail below and in Appendix J.

Table 4.2-7
Summary of Modeled Worst-Case Daily Short-Term Construction-Related Emissions under Alternative 2[1]

Source	ROG (lb/day)	NO_X (lb/day)	PM_{10} (lb/day)
Site Grading and Underground Utility Work (May 2009)[1]			
Fugitive Dust	-	-	26.29
Off-Road Diesel	1.57	9.53	0.32
On-Road Diesel	0.04	0.74	0.02
Worker Trips	0.01	0.01	-
Maximum Daily Total, Unmitigated	1.62	10.28	26.63
Building Construction (Summer 2009-Fall 2011)[2]			
Building Construction[3]			
Off-Road Diesel	2.58	15.79	0.53
Worker Trips	0.01	0.01	-
Asphalt Paving[4]			
Off-Gas	0.13	-	-
Off-Road Diesel	0.80	4.64	0.13
On-Road Diesel	0.01	0.02	-
Worker Trips	-	-	-
Architectural Coatings[5]			
Off-Gas	0.41	-	-
Worker Trips	0.01	0.01	-
Maximum Daily Total, Unmitigated	3.95	20.47	0.66

[1] On-site mobile equipment emissions for site grading were based on default emission factors and time durations of URBEMIS2002 Version 8.7.0. Construction activities that involve soil disturbance must occur between May 1 and October 15 to comply with TRPA Code Section 62.4.A unless special approval has been granted by TRPA.

[2] All building construction would begin after the completion of site grading and underground utility work. These activities could be performed during winter months, weather permitting, and are assumed to consist of work days not longer than 10.5 hours. Employee off-site vehicle trip emissions for the building construction phase were based on 30 workers per day. Though construction is projected to begin in 2009, the emission estimates shown are based on emission factors for the year 2008. Emissions generated by worker trips would be the same or lower in years beyond 2008 because of expected lower emission rates for mobile sources due to more stringent emission standards and assumed vehicle turnover. The difference is nominal, however.

[3] Emissions generated by building construction were based on default emission factors and time durations of URBEMIS2002, except an emission factor of 0.0013 pounds per square foot surface area was used for architectural coatings emissions to reflect the expected use of low VOC content architectural coatings.

[4] Asphalt emissions are based on default emission factors and time duration of URBEMIS2002 to pave a total of 1.20 acres of area.

[5] Emissions from the application of architectural coatings are based on low VOC content architectural coatings emission factors and time duration of URBEMIS2002.

See Appendix J for modeling results.

Sources: Modeling performed by EDAW 2007.

Based on the modeling conducted, construction of Alternative 2 would result in worst-case maximum unmitigated daily emissions of approximately 4 lb/day of ROG, 20 lb/day of NO_X, and 27 lb/day of PM_{10} (Table 4.2-7). Daily unmitigated construction-related emissions would not exceed the significance threshold of 82 lb/day for NO_X. However, because TRPA-recommended mitigation measures are not currently incorporated into the project description, construction-related emissions under Alternative 2, specifically PM_{10}, could violate or contribute substantially to an existing or projected air quality violation and expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to the TRPA standards (e.g., 1-hour ozone and visibility-reducing particulate standards). As a result, this would be a **significant** impact.

Mitigation Measure 4.2.2-1. Reduce the Generation of Construction-Related Emissions of ROG, NO_X, and PM_{10}. See Mitigation Measure 4.2.1-1 described above for Alternative 1. The same mitigation measure would apply.

Implementation of Mitigation Measure 4.2.2-1 would reduce Impact 4.2.2-1, to a **less-than-significant** level.

IMPACT 4.2.2-2 Generation of Long-Term Operation-Related (Regional) Emissions of Criteria Air Pollutants and Precursors. *This impact would substantially lower than Impact 4.2.1-2 described above for Alternative 1. Implementation of Alternative 2 would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. This would be a* ***less-than-significant*** *impact.*

Operation of Alternative 2 would include similar types of land uses to Alternative 1, but because the extent of development under Alternative 2 would be less than Alternative 1 (i.e., operation of a single-family grand estate with amenities, rather than the single-family multi-family residential uses), the generation of emissions would be substantially lower.

Regional stationary-, area-, and mobile-source emissions were estimated based on proposed land use types and sizes, the net increase in trip generation from the transportation analysis prepared for this project in Section 4.14, Transportation and Circulation (e.g., 30 daily vehicle trips), and default model setting for 2010 conditions.

The modeled maximum daily operational emissions under Alternative 2 are summarized in Table 4.2-8 and described in more detail below and in Appendix J. Based on the modeling conducted, project operations would result in worst-case maximum unmitigated daily emissions of approximately 1 lb/day of ROG, NO_X, and PM_{10}, 2 lb/day of CO, and negligible amounts (less than 0.1 lb/day) of SO_X, which would not exceed any of the applicable thresholds as shown in Table 4.2-8. In addition, because the significance thresholds approximately correlate with reductions from heavy-duty vehicles and land use project emission reduction requirements in the SIP, project implementation would not be anticipated to conflict with any air quality planning efforts. Furthermore, because the project's operational emissions of NO_X would not exceed the NO_X threshold, Alternative 2 would not affect TRPA's attainment designation for atmospheric deposition. Thus, long-term operation-related emissions under Alternative 2 would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. As a result, this would be a **less-than-significant** impact.

Mitigation Measures

No mitigation is required.

Table 4.2-8
Summary of Modeled Long-Term Operation-Related Emissions under Alternative 2

Sources	Project-Generated Emissions (pounds per day)				
	ROG	NO_X	PM_{10}	CO	SO_X
Summer					
Stationary Sources [1]	0.00	0.04	0.00	0.02	-
Area sources [2]	0.17	0.00	0.00	0.09	-
Mobile source [3]	0.15	0.20	0.17	1.69	-
Total	0.32	0.24	0.17	1.80	-
Winter					
Stationary Sources [1]	0.00	0.04	0.00	0.02	-
Area sources [2]	0.16	0.02	0.00	0.01	-
Mobile source [3]	0.17	0.23	0.17	2.05	-
Total	0.33	0.29	0.17	2.08	-
Thresholds					
Total emissions[4]	82.0	82.0	82.0	—	—
Stationary source emissions[5]	124.2	24.2	22.0	220.5	13.2

[1] Includes natural gas usage (e.g., from water heaters and central furnaces) and fireplaces. Does not account for possible emission reductions associated with proposed LEED certification.

[2] Area-source emissions include emissions from landscaping, application of architectural coatings, and consumer products, and are estimated based on default model settings, except an emission factor of 0.0013 pounds per square foot was used to reflect the project's use of low VOC content architectural coatings.

[3] Mobile-source emissions were estimated based on default model settings and trip generation rates and trip lengths obtained from the transportation analysis prepared for this project under buildout conditions for 2010.

[4] Total Emissions Threshold applies to the sum of stationary, area, and mobile sources for NO_X only.

[5] TRPA Thresholds apply to the stationary-source emissions only.

Source: Modeling performed by EDAW 2007

IMPACT 4.2.2-3 Generation of Long-Term Operation-Related Local Mobile-Source Emissions of Carbon Monoxide. *This impact would be substantially less than Impact 4.2.1-3 described above for Alternative 1. Long-term operation-related local mobile-source emissions of CO under Alternative 2 would not violate an air quality standard (i.e., 8-hour TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. As a result, this would be a* ***less-than-significant*** *impact.*

Operation of Alternative 2, a single family estate, would not reduce the LOS at any signalized intersections to an unacceptable level (i.e., LOS E [for more than 4 hours per day] or LOS F) or substantially worsen an already existing LOS at any signalized intersections (see Section 4.14, Transportation and Circulation, for additional detail). Thus, the generation of long-term operation-related local mobile-source emissions of CO under Alternative 2 would not violate an air quality standard (i.e., 8-hour TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. This would be a **less-than-significant** impact.

Mitigation Measures

No mitigation is required.

IMPACT 4.2.2-4 **Exposure of Sensitive Receptors to Odors.** *Like Alternative 1, Alternative 2 would result in residential land uses. No element of the project would contain features or characteristics that would be known sources of odors. Neither project construction nor operation of Alternative 2 would create objectionable odors affecting a substantial number of people. This would be a* ***less-than-significant*** *impact.*

This impact would be similar to Impact 4.2.1-4 described above for Alternative 1. See full discussion above.

Implementation of Alternative 2 would not result in any major sources of odor and the proposed land use type is not one of the common types that are known to result in odor production (e.g., landfill, wastewater treatment). Diesel exhaust from the use of on-site construction equipment would be intermittent and temporary, and would dissipate rapidly from the source. This would also be the case for any residences (the main house, caretaker cottage or guest house) that may be used before all site construction is complete. Also, because all of the initial site preparation would occur before any structures would be built and occupied, on-site residents would not be present during most of the heavy-duty equipment operation. Thus, neither project construction nor operation of Alternative 2 would create objectionable odors affecting a substantial number of people. As a result, this would be a **less-than-significant** impact.

Mitigation Measures

No mitigation is required.

IMPACT 4.2.2-5 **Exposure of Sensitive Receptors to Emissions of Hazardous Air Pollutants.** *Because Alternative 2 would be constructed on the same site and would result in residential land uses, this impact would be similar to, but lower than Impact 4.2.1-5 described above for Alternative 1. Neither construction nor operation of Alternative 2 would result in the exposure of sensitive receptors to substantial emissions of HAPs. This would be a* ***less-than-significant*** *impact.*

This impact would be similar to Impact 4.2.1-5 described above for Alternative 1. See full discussion above.

Construction of Alternative 2 would result in the generation of short-term construction-related emissions of diesel exhaust from the use of on-site heavy duty equipment. However, because the use of off-road heavy-duty diesel equipment would be temporary in combination with the highly dispersive properties of diesel PM (Zhu and Hinds 2002), and future reductions in exhaust emissions, project-generated construction-related emissions of TACs would not result in the exposure of sensitive receptors to substantial emissions of HAPs.

The long-term operation of Alternative 2 would not include the construction or operation of any major stationary sources of HAP emissions, or result in the generation of on-site mobile-source emissions of HAPs (e.g., diesel truck traffic). In addition, there are no major existing sources of HAPs in the vicinity of the proposed project site. Given that compliance with applicable standards is required for the development and operation of facilities that may emit HAPs, emissions at the project site are expected to be within established standards. Thus, neither construction nor operation of Alternative 2 would result in the exposure of sensitive receptors to substantial emissions of HAPs. As a result, this would be a less-than-significant impact.

Mitigation Measures

No mitigation is required.

Alternative 3 – Reduced Density Alternative

IMPACT 4.2.3-1 Generation of Short-Term Construction-Related Emissions of Criteria Air Pollutants and Precursors. *Because construction of Alternative 3 would require the same types of equipment and construction period length as Alternative 1, this impact would be similar to Impact 4.2.1-1 described above for Alternative 1. As under Alternative 1,* absent *TRPA-recommended mitigation measures, construction-related emissions of criteria air pollutants and precursors under Alternative 3 could contribute substantially to an existing or projected air quality violation, and expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to TRPA standards. This would be a* ***significant*** *impact.*

This impact would be essentially the same as Impact 4.2.1-1 described above for Alternative 1. See full discussion above.

The generation of short-term construction-related emissions under Alternative 3 would be similar to those discussed in Alternative 1, since the same types of heavy-duty construction equipment would be required and Alternative 3 would require an approximate 3-year construction schedule (same construction period length as Alternative 1).

The modeled maximum daily construction emissions are summarized in Table 4.2-9 and described in more detail below and in Appendix J. Note, that estimates are conservative, and actual emissions of Alternative 3 could be less over time due to the energy saving features associated with LEED certified sustainable homes.

Table 4.2-9
Summary of Modeled Worst-Case Daily Short-Term Construction-Related Emissions under Alternative 3[1]

Source	ROG (lb/day)	NO_X (lb/day)	PM_{10} (lb/day)
Site Grading and Underground Utility Work (May 2009)[1]			
Fugitive Dust	-	-	26.57
Off-Road Diesel	2.43	14.77	0.50
On-Road Diesel	0.03	0.48	0.01
Worker Trips	0.02	0.02	-
Maximum Daily Total, Unmitigated	2.48	15.27	27.08
Building Construction (Summer 2009-Fall 2012)[2]			
Building Construction[3]			
Off-Road Diesel	4.00	24.48	0.82
Worker Trips	0.12	0.08	0.01
Asphalt Paving[4]			
Off-Gas	0.09	-	-
Off-Road Diesel	1.24	7.19	0.20
On-Road Diesel	-	0.13	-
Worker Trips	-	-	-
Architectural Coatings[5]			
Off-Gas	3.32	-	-
Worker Trips	0.12	0.08	0.01
Maximum Daily Total, Unmitigated	8.89	31.96	1.04

Table 4.2-9
Summary of Modeled Worst-Case Daily Short-Term Construction-Related Emissions under Alternative 3[1]

[1] On-site mobile equipment emissions for site grading were based on default emission factors and time durations of URBEMIS2002 Version 8.7.0. Construction activities that involve soil disturbance must occur between May 1 and October 15 to comply with TRPA Code Section 62.4.A unless special approval has been granted by TRPA.

[2] All building construction would begin after the completion of site grading and underground utility work. These activities could be performed during winter months, weather permitting, and are assumed to consist of work days not longer than 10.5 hours. Employee off-site vehicle trip emissions for the building construction phase were based on 30 workers per day. Though construction is projected to begin in 2009, the emission estimates shown are based on emission factors for the year 2008. Emissions generated by worker trips would be the same or lower in years beyond 2008 because of expected lower emission rates for mobile sources due to more stringent emissions standards and assumed vehicle turnover. The difference is nominal, however.

[3] Emissions generated by building construction were based on default emission factors and time durations of URBEMIS2002, except an emission factor of 0.0013 pounds per square foot surface area was used for architectural coatings emissions to reflect the expected use of low VOC content architectural coatings.

[4] Asphalt emissions are based on default emission factors and time duration of URBEMIS2002 to pave a total of 1.15 acres of area.

[5] Emissions from the application of architectural coatings are based on low VOC content architectural coatings emission factors and time duration of URBEMIS2002.

See Appendix J for modeling results.

Sources: Modeling performed by EDAW 2007.

Based on the modeling conducted, construction of Alternative 3 would result in worst-case maximum unmitigated daily emissions of approximately 9 lb/day of ROG, 32 lb/day of NO_X, and 27 lb/day of PM_{10} (Table 4.2-9). Daily unmitigated construction-related emissions would not exceed the significance threshold of 82 lb/day for NO_X. Absent TRPA-recommended mitigation measures, construction-related emissions under Alternative 3, specifically PM_{10}, could violate or contribute substantially to an existing or projected air quality violation and expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to the TRPA standards (e.g., 1-hour ozone and visibility-reducing particulate standards). As a result, this would be a significant impact.

Mitigation Measure 4.2.3-1. Reduce the Generation of Construction-Related Emissions of ROG, NO_X, and PM_{10}. See Mitigation Measure 4.2.1-1 described above for Alternative 1. The same mitigation measure would apply.

Implementation of Mitigation Measure 4.2.3-1 would reduce Impact 4.2.3-1, to a less-than-significant level.

IMPACT 4.2.3-2 Generation of Long-Term Operation-Related (Regional) Emissions of Criteria Air Pollutants and Precursors. *Because operation of Alternative 3 would include similar types and sizes of land uses, this impact would be similar to Impact 4.2.1-2 described above for Alternative 1. Therefore, implementation of Alternative 3 would not exceed TRPA's stationary source thresholds or the recommended mass emissions threshold for NO_X. Therefore, implementation of Alternative 3 would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. This would be a* ***less-than-significant*** *impact.*

This impact would be similar to Impact 4.2.1-2 described above for Alternative 1. See full discussion above.

Operation of Alternative 3 would include similar types and sizes of land uses to Alternative 1. Regional stationary-, area-, and mobile-source emissions were estimated based on proposed land use types and sizes, the net increase in trip generation from the transportation analysis prepared for this project in Section 4.14, Transportation and Circulation (e.g., 352 daily vehicle trips), and default model setting for 2010 conditions.

The modeled maximum daily operational emissions under Alternative 3 are summarized in Table 4.2-10 and described in more detail below and in Appendix J. Based on the modeling conducted, project operations would

result in worst-case maximum unmitigated daily emissions of approximately 4 lb/day of ROG, 4 lb/day of NO_X, 2 lb/day of PM_{10}, 24 lb/day of CO, and a negligible amount (less than 0.1 lb/day) of $SO_{X,}$ which would not exceed any of the applicable thresholds as shown in Table 4.2-8. In addition, because the significance thresholds approximately correlate with reductions from heavy-duty vehicles and land use project emission reduction requirements in the SIP, project implementation would not be anticipated to conflict with any air quality planning efforts. Because the project's operational emissions of NO_X would not exceed the NO_X threshold, Alternative 3 would not affect TRPA's attainment designation for atmospheric deposition. Long-term operation-related emissions under Alternative 3 would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. This would be a **less-than-significant** impact.

Mitigation Measures

No mitigation is required.

Table 4.2-10
Summary of Modeled Long-Term Operation-Related Emissions under Alternative 3

Sources	Project-Generated Emissions (pounds per day)				
	ROG	NO_X	PM_{10}	CO	SO_X
Summer					
Stationary Sources [1]	0.04	0.46	0.00	0.20	0.00
Area sources [2]	2.04	0.02	0.00	1.13	0.01
Mobile source [3]	1.17	2.30	1.99	19.76	0.01
Total	3.85	2.78	1.99	21.09	0.02
Winter					
Stationary Sources [1]	0.04	0.46	0.00	0.20	0.00
Area sources [2]	1.92	0.31	0.02	0.13	0.00
Mobile source [3]	2.05	2.75	1.99	24.08	0.01
Total	4.01	3.52	2.01	24.41	0.01
Thresholds					
Total emissions[4]	82.0	82.0	82.0	—	—
Stationary source emissions[5]	124.2	24.2	22.0	220.5	13.2

[1] Includes natural gas usage (e.g., from water heaters and central furnaces) and fireplaces. Does not account for possible emission reductions associated with proposed LEED certification.

[2] Area-source emissions include emissions from landscaping, application of architectural coatings, and consumer products, and are estimated based on default model settings, except an emission factor of 0.0013 pounds per square foot was used to reflect the project's use of low VOC content architectural coatings.

[3] Mobile-source emissions were estimated based on default model settings and trip generation rates and trip lengths obtained from the transportation analysis prepared for this project under buildout conditions for 2010.

[4] Total Emissions Threshold applies to the sum of stationary, area, and mobile sources for NO_X only.

[5] TRPA Thresholds apply to the stationary-source emissions only.

Source: Modeling performed by EDAW 2007

IMPACT 4.2.3-3 Generation of Long-Term Operation-Related Local Mobile-Source Emissions of Carbon Monoxide. *This impact would be the same as Impact 4.2.1-3 described above for Alternative 1. Therefore, long-term operation-related local mobile-source emissions of CO under Alternative 3 would not violate an air quality standard (i.e., 8-hour TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. This would be a* ***less-than-significant*** *impact.*

This impact would be similar to Impact 4.2.1-3 described above for Alternative 1. See full discussion above.

Operation of Alternative 3 would also not reduce the LOS at any signalized intersections to an unacceptable level (i.e., LOS E [for more than 4 hours per day] or LOS F) or substantially worsen an already existing LOS at any signalized intersections (see Section 4.14, Transportation and Circulation, for additional detail). Thus, the generation of long-term operation-related local mobile-source emissions of CO under Alternative 3 would not violate an air quality standard (i.e., 8-hour TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. As a result, this would be a **less-than-significant** impact.

Mitigation Measures

No mitigation is required.

IMPACT 4.2.3-4 Exposure of Sensitive Receptors to Odors. *Because Alternative 3 would be constructed on the same site and would result in the operation of similar types of land use, this impact would be the same as Impact 4.2.1-4 described above for Alternative 1. Therefore, neither project construction nor operation of Alternative 3 would create objectionable odors affecting a substantial number of people. This would be a* ***less-than-significant*** *impact.*

This impact would be similar to Impact 4.2.1-4 described above for Alternative 1. See full discussion above.

Implementation of Alternative 3 would not result in any major sources of odor and the proposed land use type is not one of the common types that are known to result in odor production (e.g., landfill, coffee roaster, wastewater treatment). Diesel exhaust from the use of on-site construction equipment would be intermittent and temporary, and would dissipate rapidly from the source. This would also be the case for any residents who occupy on-site units before construction of other buildings is complete. Also, because all of the initial site preparation would occur before any structures would be built and occupied; these on-site residents would not be present during most of the heavy-duty equipment operation. Thus, neither project construction nor operation of Alternative 3 would create objectionable odors affecting a substantial number of people. As a result, this would be a **less-than-significant** impact.

Mitigation Measures

No mitigation is required.

IMPACT 4.2.3-5 Exposure of Sensitive Receptors to Emissions of Hazardous Air Pollutants. *Because Alternative 3 would be constructed on the same site and would result in the operation of similar types of land uses, this impact would be the same as Impact 4.2.1-5 described above for Alternative 1. Therefore, neither construction nor operation of Alternative 3 would result in the exposure of sensitive receptors to substantial emissions of HAPs. This would be a* ***less-than-significant*** *impact.*

This impact would be similar to Impact 4.2.1-5 described above for Alternative 1. See full discussion above.

Construction of Alternative 3 would result in the generation of short-term construction-related emissions of diesel exhaust from the use of on-site heavy duty equipment. However, because the use of off-road heavy-duty diesel equipment would be temporary in combination with the highly dispersive properties of diesel PM (Zhu and Hinds 2002), and future reductions in exhaust emissions, project-generated construction-related emissions of TACs would not result in the exposure of sensitive receptors to substantial emissions of HAPs.

The long-term operation of Alternative 3 would not include the construction or operation of any major stationary sources of HAP emissions, or result in the generation of on-site mobile-source emissions of HAPs (e.g., diesel truck traffic). In addition, there are no major existing sources of HAPs in the vicinity of the proposed project site. Given that compliance with applicable standards is required for the development and operation of facilities that may emit HAPs, emissions at the project site are expected to be within established standards. Thus, neither construction nor operation of Alternative 3 would result in the exposure of sensitive receptors to substantial emissions of HAPs. As a result, this would be a less-than-significant impact.

Mitigation Measures

No mitigation is required.

Alternative 4 – Increased Density Alternative

IMPACT 4.2.4-1 **Short-Term Construction-Generated Criteria Air Pollutant and Precursor Emissions.** *Because construction of Alternative 4 would require the same types of equipment and construction period length, this impact would be similar to Impact 4.2.1-1 described above for Alternative 1. As under Alternative 1,* absent *TRPA-recommended mitigation measures, construction-related emissions of criteria air pollutants and precursors under Alternative 4 could contribute substantially to an existing or projected air quality violation, and expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to TRPA standards. This would be a* ***significant*** *impact.*

This impact would be essentially the same as Impact 4.2.1-1 described above for Alternative 1. See full discussion above.

The generation of short-term construction-related emissions under Alternative 4 would be similar to those discussed in Alternative 1, since the same types of heavy-duty construction equipment would be required and Alternative 4 would require an approximate 3-year construction schedule (same construction period length as Alternative 1).

The modeled maximum daily construction emissions are summarized in Table 4.2-11 and described in more detail below and in Appendix J. Note, that estimates are conservative, and actual emissions of Alternative 3 could be less over time due to the energy saving features associated with LEED certified sustainable homes.

Based on the modeling conducted, construction of Alternative 4 would result in worst-case maximum unmitigated daily emissions of approximately 10 lb/day of ROG, 32 lb/day of NO_X, and 27 lb/day of PM_{10} (Table 4.2-11). Daily unmitigated construction-related emissions would not exceed the significance threshold of 82 lb/day for NO_X. Absent TRPA-recommended mitigation measures, construction-related emissions under Alternative 4, specifically PM_{10}, could violate or contribute substantially to an existing or projected air quality violation and expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to the TRPA standards (e.g., 1-hour ozone and visibility-reducing particulate standards). As a result, this would be a **significant** impact.

Table 4.2-11
Summary of Modeled Worst-Case Daily Short-Term Construction-Related Emissions under Alternative 4[1]

Source	ROG (lb/day)	NO_X (lb/day)	PM_{10} (lb/day)
Site Grading and Underground Utility Work (May 2009)[1]			
Fugitive Dust	-	-	26.57
Off-Road Diesel	2.43	14.77	0.50
On-Road Diesel	0.03	0.48	0.01
Worker Trips	0.02	0.02	-
Maximum Daily Total, Unmitigated	2.48	15.27	27.08
Building Construction (Summer 2009-Fall 2012)[2]			
Building Construction[3]			
Off-Road Diesel	4.00	24.48	0.82
Worker Trips	0.15	0.09	0.01
Asphalt Paving[4]			
Off-Gas	0.08	-	-
Off-Road Diesel	1.24	7.19	0.20
On-Road Diesel	-	0.13	-
Worker Trips	-	-	-
Architectural Coatings[5]			
Off-Gas	3.90	-	-
Worker Trips	0.15	0.09	0.01
Maximum Daily Total, Unmitigated	9.52	31.98	1.04

[1] On-site mobile equipment emissions for site grading were based on default emission factors and time durations of URBEMIS2002 Version 8.7.0. Construction activities that involve soil disturbance must occur between May 1 and October 15 to comply with TRPA Code Section 62.4.A unless special approval has been granted by TRPA.

[2] All building construction would begin after the completion of site grading and underground utility work. These activities could be performed during winter months, weather permitting, and are assumed to consist of work days not longer than 10.5 hours. Employee off-site vehicle trip emissions for the building construction phase were based on 30 workers per day. Though construction is projected to begin in 2009, the emission estimates shown are based on emission factors for the year 2008. Emissions generated by worker trips would be the same or lower in years beyond 2008 because of expected lower emission rates for mobile sources due to more stringent emissions standards and assumed vehicle turnover. The difference is nominal, however.

[3] Emissions generated by building construction were based on default emission factors and time durations of URBEMIS2002, except an emission factor of 0.0013 pounds per square foot surface area was used for architectural coatings emissions to reflect the expected use of low VOC content architectural coatings.

[4] Asphalt emissions are based on default emission factors and time duration of URBEMIS2002 to pave a total of 1.01 acres of area.

[5] Emissions from the application of architectural coatings are based on low VOC content architectural coatings emission factors and time duration of URBEMIS2002.

See Appendix J for modeling results.

Sources: Modeling performed by EDAW 2007.

Mitigation Measure 4.2.4-1. Reduce the Generation of Construction-Related Emissions of ROG, NO_X, and PM_{10}. See Mitigation Measure 4.2.1-1 described above for Alternative 1. The same mitigation measure would apply.

Implementation of Mitigation Measure 4.2.4-1 would reduce Impact 4.2.4-1, to a less-than-significant level.

IMPACT 4.2.4-2 **Generation of Long-Term Operation-Related (Regional) Emissions of Criteria Air Pollutants and Precursors.** *Because operation of Alternative 4 would include similar types and sizes of land uses, this impact would be similar to Impact 4.2.1-2 described above for Alternative 1. Therefore, implementation of Alternative 4 would not exceed TRPA's stationary source thresholds or the recommended mass emissions threshold for NO_X. Therefore, implementation of Alternative 1 would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. This would be a* ***less-than-significant*** *impact.*

This impact would be essentially the same as Impact 4.2.1-2 described above for Alternative 1. See full discussion above.

Operation of Alternative 4 would include similar types and sizes of land uses to Alternative 1. Regional stationary-, area-, and mobile-source emissions were estimated based on proposed land use types and sizes, the net increase in trip generation from the transportation analysis prepared for this project in Section 4.14, Transportation and Circulation (e.g., 434 daily vehicle trips), and default model setting for 2010 conditions.

The modeled maximum daily operational emissions under Alternative 4 are summarized in Table 4.2-12 and described in more detail below and in Appendix J. Note, that estimates are conservative, and actual emissions of Alternative 4 could be less over time due to the energy saving features associated with LEED certified sustainable homes.Based on the modeling conducted, project operations would result in worst-case maximum unmitigated daily emissions of approximately 5 lb/day of ROG, 4 lb/day of NO_X, 2 lb/day of PM_{10}, 30 lb/day of CO, and a negligible amount (less than 0.1 lb/day) of SO_X, which would not exceed any of the applicable thresholds as shown in Table 4.2-8. In addition, because the significance thresholds approximately correlate with reductions from heavy-duty vehicles and land use project emission reduction requirements in the SIP, project implementation would not conflict with any air quality planning efforts. Because the project's operational emissions of NO_X would not exceed the NO_X threshold, Alternative 4 would not affect TRPA's attainment designation for atmospheric deposition. Long-term operation-related emissions under Alternative 4 would not violate an air quality standard, contribute substantially to an existing or projected air quality violation, expose sensitive receptors to substantial pollutant concentrations, or conflict with or obstruct implementation of the applicable air quality plan. This would be a **less-than-significant** impact.

Mitigation Measures

No mitigation is required.

Table 4.2-12
Summary of Modeled Long-Term Operation-Related Emissions under Alternative 4

Sources	Project-Generated Emissions (pounds per day)				
	ROG	NO_X	PM_{10}	CO	SO_X
Summer					
Stationary Sources [1]	0.04	0.58	0.00	0.25	0.00
Area sources [2]	2.96	0.03	0.00	1.67	0.01
Mobile source [3]	2.20	2.85	2.46	24.41	0.01
Total	5.20	3.46	2.46	26.33	0.02
Winter					
Stationary Sources [1]	0.04	0.58	0.00	0.25	0.00
Area sources [2]	2.96	0.39	0.03	0.17	0.01
Mobile source [3]	2.53	3.40	2.46	29.76	0.01
Total	5.33	4.37	2.49	30.18	0.02

Table 4.2-12
Summary of Modeled Long-Term Operation-Related Emissions under Alternative 4

Sources	Project-Generated Emissions (pounds per day)				
	ROG	NO_X	PM_{10}	CO	SO_X
Thresholds					
Total emissions[4]	82.0	82.0	82.0	—	—
Stationary source emissions[5]	124.2	24.2	22.0	220.5	13.2

[1] Includes natural gas usage (e.g., from water heaters and central furnaces) and fireplaces. Does not account for possible emission reductions associated with proposed LEED certification.

[2] Area-source emissions include emissions from landscaping, application of architectural coatings, and consumer products, and are estimated based on default model settings, except an emission factor of 0.0013 pounds per square foot was used to reflect the project's use of low VOC content architectural coatings.

[3] Mobile-source emissions were estimated based on default model settings and trip generation rates and trip lengths obtained from the transportation analysis prepared for this project under buildout conditions for 2010.

[4] Total Emissions Threshold applies to the sum of stationary, area, and mobile sources for NO_X only.

[5] TRPA Thresholds apply to the stationary-source emissions only.

Source: Modeling performed by EDAW 2007

IMPACT 4.2.4-3 Generation of Long-Term Operation-Related Local Mobile-Source Emissions of Carbon Monoxide. *This impact would be the same as Impact 4.2.1-3 described above for Alternative 1. Therefore, long-term operation-related local mobile-source emissions of CO under Alternative 4 would not violate an air quality standard (i.e., 8-hour TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. This would be a* ***less-than-significant*** *impact.*

This impact would be essentially the same as Impact 4.2.1-3 described above for Alternative 1. See full discussion above.

Operation of Alternative 4 would also not reduce the LOS at any signalized intersections to an unacceptable level (i.e., LOS E [for more than 4 hours per day] or LOS F) or substantially worsen an already existing LOS at any signalized intersections (see Section 4.14, Transportation and Circulation, for additional detail). Thus, the generation of long-term operation-related local mobile-source emissions of CO under Alternative 4 would not violate an air quality standard (i.e., 8-hour TRPA standard of 6 ppm), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. As a result, this would be a **less-than-significant** impact.

Mitigation Measures

No mitigation is required.

IMPACT 4.2.4-4 Exposure of Sensitive Receptors to Odors. *Because Alternative 4 would be constructed on the same site and would result in the operation of similar types of land use, this impact would be the same as Impact 4.2.1-4 described above for Alternative 1. Therefore, neither project construction nor operation of Alternative 4 would create objectionable odors affecting a substantial number of people. This would be a* ***less-than-significant*** *impact.*

This impact would be essentially the same as Impact 4.2.1-4 described above for Alternative 1. See full discussion above.

Implementation of Alternative 4 would not result in any major sources of odor and the proposed land use type is not one of the common types that are known to result in odor production (e.g., landfill, coffee roaster, wastewater treatment). Diesel exhaust from the use of on-site construction equipment would be intermittent and temporary, and would dissipate rapidly from the source. This would also be the case for any residents who occupy on-site units before construction of other buildings is complete. Also, because all of the initial site preparation would occur before any structures would be built and occupied; these on-site residents would not be present during most of the heavy-duty equipment operation. Thus, neither project construction nor operation of Alternative 4 would create objectionable odors affecting a substantial number of people. As a result, this would be a **less-than-significant** impact.

Mitigation Measures

No mitigation is required.

IMPACT 4.2.4-5 Exposure of Sensitive Receptors to Emissions of Hazardous Air Pollutants. *Because Alternative 4 would be constructed on the same site and would result in the operation of similar types of land uses, this impact would be the same as Impact 4.2.1-5 described above for Alternative 1. Therefore, neither construction nor operation of Alternative 4 would result in the exposure of sensitive receptors to substantial emissions of HAPs. This would be a* ***less-than-significant*** *impact.*

This impact would be essentially the same as Impact 4.2.1-5 described above for Alternative 1. See full discussion above.

Construction of Alternative 4 would result in the generation of short-term construction-related emissions of diesel exhaust from the use of on-site heavy duty equipment. However, because the use of off-road heavy-duty diesel equipment would be temporary in combination with the highly dispersive properties of diesel PM (Zhu and Hinds 2002), and future reductions in exhaust emissions, project-generated construction-related emissions of TACs would not result in the exposure of sensitive receptors to substantial emissions of HAPs.

The long-term operation of Alternative 4 would not include the construction or operation of any major stationary sources of HAP emissions, or result in the generation of on-site mobile-source emissions of HAPs (e.g., diesel truck traffic). In addition, there are no major existing sources of HAPs in the vicinity of the proposed project site. Given that compliance with applicable standards is required for the development and operation of facilities that may emit HAPs, emissions at the project site are expected to be within established standards. Thus, neither construction nor operation of Alternative 4 would result in the exposure of sensitive receptors to substantial emissions of HAPs. As a result, this would be a less-than-significant impact.

Mitigation Measures

No mitigation is required.

Alternative 5 – No Project

Under Alternative 5, no construction or land use changes would occur on the project site. The project site would remain in its current undeveloped state. There would be **no impacts** associated with emissions of criteria air pollutants or precursor emissions, or the exposure of sensitive receptors to hazardous air pollutant or odors associated with Alternative 5.