4.9 AIR QUALITY

ENVIRONMENTAL SETTING

Existing Air Quality Levels

The Lake Tahoe Basin tends to be more susceptible to air quality impacts than other areas due to its unique geographic nature (basin). Higher pollution levels are caused by temperature inversions (which cause the air pollution to stay close to the ground and lake) in conjunction with local and non-locally generated pollution. Lake Tahoe attracts millions of visitors each year resulting in significant pollution from both resident and non-resident vehicles (www.trpa.org). Table 4.9-1 shows TRPA's air quality indicators and attainment status for the Lake Tahoe Air Basin.

Table 4.9-1

2006 Air Quality Indicator Attainment Status

Threshold Name	Attainment Status				
	1991	1996	2001	2006	5-Year Trend
Carbon Monoxide	Non-Attainment	Attainment	Attainment	Non-Attainment	Positive
Ozone	Non-Attainment	Non-Attainment	Non-Attainment	Non-Attainment	Unknown[1]
Particulate Matter	Non-Attainment	Non-Attainment	Attainment	Non-Attainment	Unknown
Visibility	Attainment	Non-Attainment	Non-Attainment	Attainment	Positive
Vehicle Miles Traveled	Non-Attainment	Non-Attainment	Non-Attainment	Non-Attainment	Positive
Atmospheric Deposition	Unknown	Unknown	Unknown	Unknown	Unknown

Source: TRPA 2006 Threshold Evaluation Report, Table 2-2: 2006 Air Quality Indicator Attainment Status

Notes:
* Information for 1991 to 2001 was from the 2001 Threshold Report.
[1] More stringent ozone standards became effective in May 2006. This may result in additional ozone violations in the future.

Carbon Monoxide

Carbon monoxide (CO) is a tasteless, odorless, and colorless gas that is slightly lighter than air. It affects humans by reducing the supply of oxygen to the tissues of the body and is of concern to public health. The primary source of CO emissions is associated with the combustion of hydrocarbon fuels by motor vehicles, home heating devices such as fireplaces, stoves, and furnaces, and industrial processes. In the Tahoe Basin, the primary source of CO emissions is from mobile sources such as motor vehicles and boats.

The TRPA threshold for carbon monoxide states that CO concentrations must be maintained at or below 6.0 parts per million (ppm), averaged over eight hours. This is also the California and Nevada 8-hour CO standard for the Tahoe Region. The value used to determine attainment of this standard is the second highest CO concentration measured at the Stateline California monitoring station. In addition, there is a federal 8-hour standard of 9 ppm and California and Nevada 1-hour average standards of 20 and 35 ppm, respectively. According to the TRPA 2006 Threshold Evaluation for Air Quality the current CO status is in non-attainment; however, the report indicates a positive trend toward attainment.

Ozone

Ozone (O_3) is defined as secondary pollutant and is created by a photochemical reaction between hydrocarbons, oxide of nitrogen, and sunlight. This pollutant posses a significant health risk especially to the young and elderly in the form of lung and other respiratory illnesses. Ozone also damages tree and plants, particularly Ponderosa Pines, Jeffrey Pines, and Quaking Aspen which make up the majority of the Lake Tahoe Basin's tree population (Davis and Gerhold, 1976).

The primary ozone precursors are produced from human activities such as the combustion of fossil fuel, chemical processing, fuel storage and handling, and solvent usage. Since ozone formation is a photochemical process, higher concentrations are created on sunny, summer days when the sun's radiation is at its peak. In the Tahoe Basin, vehicle and watercraft emissions are the primary source of ozone precursors. For this reason, transportation control measures are the best strategy for the control of this pollutant.

The TRPA's indicator for ozone states that ozone levels shall not meet or exceed a 1-hour standard of 0.08 ppm. Attainment is based on the number of 1-hour periods, which equal or exceed the federal, Nevada, or TRPA standard at any of the permanent monitoring sites, and the number of 1-hour periods that exceed the California standard.

Ozone has been monitored in the Lake Tahoe Basin at no less than 6 separate sites over a 10 year period. However, since 2006, only two sites remain active. According to the TRPA 1991, 1996, 2001 and 2006 Threshold Evaluation for Air Quality, the current ozone status is in non-attainment. The 2006 Threshold Evaluation also indicates a negative trend.

Fine Particulates (PM_{10})

Suspended particulate matter comes from a combination of sources including: fugitive dust, vehicle and residential combustion processes, road dust and deicing practices, aerosols from the conifer forest, and direct and secondary formation from gases. Federal and state agencies have established particulate standards to protect the public health. These standards address inhalable particulate matter of less than 10 microns in diameter (PM10) due to their ability to cause health concerns when inhaled into the lungs and/or absorbed by the blood stream. Many particulates are from man-made sources, such as deicing practices on the roadways, construction dust, wood smoke and diesel fuel emissions. Winds may also cause soil erosion and create high particulate concentrations where vegetation has been removed or disturbed. Many factors, including population, the amount and distribution of rainfall, the amount of soil disturbance, and variations in wind speed, have a significant influence on particulate concentrations.

The TRPA's indicator for PM10 states that particulate matter concentrations shall not exceed the California and Federal standards for 24-hour concentrations (50 and 150 μg/m3, respectively) and the annual average (20 and 50 μg/m3, respectively). Attainment is based on the number of 24-

hour periods exceeding the applicable federal or state standards at any permanent monitoring station and the annual average PM10 concentration (μg/m3) at any permanent monitoring station. Data was collected by the Air Resources Board at the Sandy Way site located in South Lake Tahoe between 2001 and 2005. During this time period, the national 24-hour standard was not exceeded and the California standard was exceeded six times. The PM10 indicator was previously in attainment between 1996 and 2001; however, in recent years PM10 has experienced non-attainment events. For this reason, this indicator is listed as non-attainment. However, data is not available for the 2004 or 2005 calendar years; therefore, it is not possible to establish a reliable trend.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is formed primarily in the atmosphere from a reaction between nitric oxide (NO) and oxygen or O_3. Long term exposure to high NO_2 levels can contribute to the development of acute or chronic bronchitis. Nitric oxide is formed during high temperature combustion processes (e.g., automobile engines) when the nitrogen and oxygen in the air combine. Although NO is much less harmful than NO_2, it can be converted to NO_2 in the atmosphere within a matter of hours, or even minutes under certain conditions. Peak NO_2 levels typically occur during late fall and winter months in South Lake Tahoe.

Sulfur Dioxide

Sulfur dioxide is produced when any sulfur-containing fuel is burned. Due to the complexity of the chemical reactions that convert SO_2 to other compounds (such as sulfates), peak concentrations of SO_2 occur at different times of the year in different parts of the state, depending on local fuel characteristics, weather, and topography. Although no recent monitoring data is available for SO_2 in the area, according to the TRPA, concentrations are well below all established thresholds. The Lake Tahoe Air Basin is considered an attainment area for SO_2 for state and federal planning purposes.

Visibility

Visibility refers to the clarity of the atmosphere and is typically measured as the distance one can see at a particular location and time. Visibility is directly related to the ambient concentrations of particulate matter in the atmosphere, particularly $PM_{2.5}$ because of their long retention times in the air. Visibility standards within the Lake Tahoe Basin are separated into two categories; regional visibility and sub-regional visibility. Regional visibility refers to the overall prevailing visibility in the Lake Tahoe Basin, and sub-regional visibility is the visibility seen over the more urbanized areas.

New monitoring protocol was adopted by TRPA for measuring visibility in March 2000 and data collection results for regional and sub-regional visibility classified the Basin as being in attainment through 2004. Monitoring was ceased at that time and visibility is currently classified as “positive”.

The TRPA visibility threshold also contains a requirement to reduce suspended particles by 30% from the 1981 base levels, however because no base level was ever established, attainment is currently unknown.

Vehicle Miles Traveled

TRPA adopted the VMT threshold in 1982 as both a water quality and air quality threshold. The TRPA thresholds for air quality, under both visibility and nitrate deposition, include the following management standard; "reduce vehicle miles of travel by 10 percent of the 1981 base values." The 1981 VMT was determined to be 1,648,466 VMT and therefore the attainment level for this indicator would be 1,483,619 miles for a peak summer day. The 1981 VMT estimate is a modeled value that has been calculated over the years using various travel demand software programs and interim annual methods based on traffic counts. This threshold remains in non-attainment since 1991, but is recently experiencing a positive trend.

Previously, an older, less detailed TranPlan model was used to calculate VMT based the number of trips made on the highway network and the distance between trip origins and trip destinations. Based on the previous travel demand model, TRPA's assessment of VMT indicates that the 1981 level of 1,648,466 VMT on a peak summer day decreased by approximately 4 percent to 1,580,000 in 2004. To attain the desired ten percent reduction, a target of 1,483,619 VMT, based on the original model, must be attained. TRPA Code of Ordinances Chapter 93 includes requirements to achieve TRPA's Air Quality Plan related to VMT.

TRPA's new TransCAD model is based on an expanded and more complex street network than the old TranPlan model. For that reason, the new model results are not directly comparable to the old model and should be considered a worse case VMT analysis. Future forecasts will be made using the new model, but comparisons to past VMT estimates must be made using an updated method to the old model. Using actual traffic counts to update previous estimates, VMT has been estimated to have decreased by 6.5 percent from 1981 levels." (Mobility 2030)

Atmospheric Nutrient Loading

The two main nutrients of concern in the Lake Tahoe Basin are nitrogen (in gaseous form and particulate form) and phosphorous (in particulate form). Additionally, gaseous nitric acid and particulate ammonium nitrate are cause for concern because their small size does not allow them to easily settle out of the air. Combustion processes from automobiles and other sources are the main source of gaseous emissions of nitrogen compounds in the Basin, however they can also be carried into the Lake Tahoe Basin from outside sources as well.

The TRPA threshold for atmospheric nutrient loading was developed to reduce the transport of nitrate into the Basin and reduce oxides of nitrogen (NOx) produced in the Basin. The threshold requires a reduction in direct dissolved inorganic nitrogen (DIN) load by 20% of the 1973-1981 annual average. However, the status of the indicator currently is unknown since an acceptable method for measuring this indicator has not been developed.

Emission Sources

To provide a better understanding of the causes and potential for control of air pollution in the Lake Tahoe Air Basin, summaries of the estimated 2008 emission sources for each of the criteria pollutants are presented in Table 4.9-2 (ozone sources are described from summaries of its precursors, reactive hydrocarbons and oxides of nitrogen).

Table 4.9-2

Estimated Annual Average Emissions for the California Side of the Lake Tahoe Air Basin in 2008 (Tons/Day)

	TOG *	ROG **	CO	NO_X	SO_X	PM_{10}
Stationary Sources						
Fuel Combustion	0.01	0.01	0.04	0.20	0.00	0.01
Cleaning and Surface Coatings	0.27	0.24	-	-	-	-
Petroleum Production and Marketing	0.23	0.04	-	-	-	-
Industrial Processes	-	-	0.01	0.00	0.00	0.00
Total Stationary Sources	**0.52**	**0.29**	**0.05**	**0.21**	**0.00**	**0.02**
Area-Wide Sources						
Solvent Evaporation	0.97	0.91	-	-	-	-
Miscellaneous Processes						
Residential Fuel Combustion	*2.82*	*1.24*	*11.82*	*0.33*	*0.05*	*1.82*
Paved Road Dust	-	-	-	-	-	*1.11*
Unpaved Road Dust	-	-	-	-	-	*1.42*
Other Miscellaneous Processes	*1.43*	*0.31*	*2.76*	*0.07*	*0.55*	*0.86*
Miscellaneous Processes	4.25	1.55	14.58	0.40	0.60	5.21
Total Area-Wide Sources	**5.22**	**2.45**	**14.58**	**0.40**	**0.06**	**5.21**
Mobile Sources						
On-Road Motor Vehicles	1.54	1.42	14.79	2.11	0.01	0.09
Other Mobile Sources	2.40	2.21	14.49	2.46	0.04	0.25
Total Mobile Sources	**3.94**	**3.64**	**29.28**	**4.57**	**0.05**	**0.34**
Grand Total for Lake Tahoe Air Basin	***9.67***	***6.38***	***43.91***	***5.18***	***0.11***	***5.57***

Source: California Air Resources Board, Almanac Emission Projection Data (Published in 2009)
Fehr & Peers, 2009

Notes:

* Total Organic Compounds

** Reactive Organic Compounds, a subset of TOG, precursor to ozone – also referred to as reactive hydrocarbons.

Estimates of emissions in the Lake Tahoe Air Basin were prepared from data compiled by the California Air Resources Board (CARB). Working with local air pollution control districts, CARB compiled data on all types of air pollution sources throughout the state. Emissions were estimated based on fuel consumption rates, source tests, processing loss estimates, and other information. CARB and local district estimates of area-wide emission sources have been refined over many years and cover virtually every source of emissions, from small home furnaces to the largest industrial facilities. Motor vehicle emissions are estimated from laboratory tests of samples of vehicles coupled with traffic volume data

from local areas. The collection of the emissions estimates for all sources is referred to as the "emissions inventory."

Reactive Hydrocarbons

Together with oxides of nitrogen, hydrocarbons form O_3. As Table 4.9-2 shows, mobile sources are the largest contributor, accounting for approximately 57 percent (3.64 tons per day) of all hydrocarbon emissions. Area-wide sources also contribute heavily with emissions of 2.45 tons per day (38 percent).

Carbon Monoxide

As Table 4.9-2 shows, approximately 67 percent (29.28 tons per day) of CO emissions in the Lake Tahoe Basin come from mobile sources, including 34 percent (14.79 tons per day) from on-road motor vehicles. Residential fuel combustion also contributes a significant percentage of CO (27 percent).

CO emissions result from the incomplete combustion of fuel within vehicle engines. CO emissions are not a significant factor in industrial or stationary source activities (even in more heavily industrial source-dominated areas than Lake Tahoe). This is because industrial fuel combustion equipment generally uses a combustion process in which burning fuel is surrounded by large amounts of excess air. Therefore, combustion is more complete.

Oxides of Nitrogen

NO_x emissions are caused by fuel combustion under high temperature conditions and, along with hydrocarbons, are precursors to O_3 formation. As shown in Table 4.9-2, mobile sources are the primary source of NO_x emissions in the Lake Tahoe Air Basin, contributing 88 percent (4.57 tons per day) of total NO_x emissions. As with hydrocarbons, on-road motor vehicle emissions are the largest single category at 41 percent of the total. Residential fuel combustion is the only significant area-wide source of NO_x emissions in Lake Tahoe, accounting for only about 6 percent of the Air Basin total.

Oxides of Sulfur

SO_x is primarily emitted when sulfur-containing fuel is burned, or from sulfur processing at chemical plants. In the absence of large stationary sources of this type in the Lake Tahoe Air Basin, the only significant sources of SO_x are residential fuel combustion (included with miscellaneous processes under area-wide sources) and mobile sources, as shown in Table 4.9-2. Sulfur emissions do not represent an air quality problem in the Lake Tahoe Air Basin.

Particulate Matter

In contrast to the other criteria pollutants, PM_{10} and $PM_{2.5}$ emissions are not dominated by exhaust emissions from mobile sources. Rather, the largest sources are residential fuel combustion and paved and unpaved road dust (included in miscellaneous processes under are-wide sources). Road dust refers to the suspension of dust in the air due to tire contact or turbulence caused by a moving vehicle. It does not include combustion emissions. All area-wide sources combined contribute approximately 94 percent of total particulate matter emissions. All mobile source combustion emissions contribute less than 10 percent of total PM_{10} and $PM_{2.5}$ emissions.

REGULATORY SETTING

The Federal Government and State of Nevada have adopted standards for certain air pollutants, termed "criteria pollutants". In addition, TRPA has established emission thresholds for stationary and mobile sources.

Federal and State Regulations

The Federal Clean Air Act provides that national ambient air quality standards (NAAQS) can be exceeded no more than once each year. The United States Environmental Protection Agency (EPA) has set standards for seven principal pollutants, called "criteria" pollutants. These include carbon monoxide (CO), lead, nitrogen dioxide (NO_2), particulate matter less than 10 microns in size (PM_{10}), particulate matter less than 2.5 microns in size ($PM_{2.5}$), ozone (O_3) and sulfur dioxide (SO_2).

The Nevada Division of Environmental Protection (NDEP) Bureau of Air Pollution Control oversees air quality programs for all Nevada counties except for Washoe and Clark Counties, which have their own distinct Air Quality jurisdictions. The Washoe County website states that areas not meeting NAAQS are required to prepare, submit, and implement State Implementation Plans (SIPs) demonstrating attainment and maintenance of these standards. Both state and NAAQSs consist of two parts: an allowable concentration of a pollutant, and an averaging time over which the concentration is to be measured. The concentrations are based on results of studies of the effects of the pollutants on human health, crops and vegetation, and occasionally damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short period of time (1 hour, for instance), or to a relatively lower average concentration over a much longer period (1 month or 1 year). For some pollutants, there is more than one air quality standard, which reflects both its short-term and long-term effects.

The California Clean Air Act provides ambient air quality standards specific to the State of California. According the California EPA website, the California Clean Air Act provides a comprehensive framework for air quality planning regulation through specific air quality goals, planning mechanisms, regulatory strategies, and standards of progress.

The State (California and Nevada) and Federal ambient air quality standards for each criteria pollutant can be found in Table 4.9-3.

Regional

In August 1982, TRPA adopted Environmental Threshold carrying capacities for the Lake Tahoe Basin. These thresholds serve as the basis for the Tahoe Regional Plan (TRPA 1987) and the Plan's implementing ordinances. For air quality, the thresholds are related, but not always identical, to state and federal ambient air quality standards (the Tahoe Regional Planning Compact requires TRPA to adopt schedules to meet all local, state and federal standards). The TRPA ambient air quality standards for stationary sources are found in Chapter 91 - Air Quality Control of the TRPA Code of Ordinances and shown in Table 4.9-4. For some pollutants, TRPA provides a more stringent standard designed to protect human and ecosystem health than the states or federal government.

The TRPA Code of Ordinances provides standards applicable to development related to VMT and traffic generation. The Code of Ordinances states that a "significant increase" is an increase of more than 200 daily vehicle trips, a "minor increase" is an increase of 100 to 200 daily vehicle trips, and an "insignificant increase" is an increase of less than 100 daily trips. If a project results in a significant increase in daily vehicle trips, all traffic and air quality impacts must be mitigated consistent with the

environmental thresholds, the Goals and Policies, the Regional Transportation Plan and the 1992 Air Quality Plan. TRPA further defines any unmitigated air pollution as a significant impact for non-attainment air quality thresholds.

Table 4.9-3

State and Federal Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	TRPA Standards	Nevada Standards	California Standards	Federal Standards
Carbon Monoxide (CO)	8-hour period 1-hour period	6 ppm[j] *	6 ppm[a] 35 ppm	9 ppm (6 ppm for Tahoe) 20 ppm	9 ppm[c] 35 ppm[c]
Ozone (O_3)	8-hour period 1-hour period	-- 0.08 ppm[k]	-- 0.10 ppm[a]	0.070 ppm 0.09 ppm[k]	0.075 ppm[d] --
Particulate Matter less than 10 microns in size (PM_{10})	24-hour period Annual Arithmetic Mean	* *	150 µg/m^3 50 µg/m^3	50 µg/m^3 20 µg/m^3	150 µg/m^3[e] 50 µg/m^3
Particulate Matter less than 2.5 microns in size ($PM_{2.5}$)	24-hour period Annual Arithmetic Mean	-- --	-- --	-- 12 µg/m^3	35 µg/m^3[f] 15 µg/m^3[g]
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean 1-hour period	-- --	0.05 ppm (100 µg/m^3) --	0.03 ppm 0.18 ppm	0.053 ppm (100 µg/m^3) --
Sulfur Dioxide (SO_2)	24-hour period Annual Arithmetic Mean 3-hour period 1-hour period	-- -- -- --	0.14 ppm 0.03 ppm 0.5 ppm (1300 µg/m^3) --	0.04 ppm -- -- 0.25 ppm	0.14 ppm[c] 0.03 ppm 0.5 ppm (1300 µg/m^3)[b] --
Lead (Pb)	Rolling 3-Month Average Quarterly Average	-- --	-- 1.5 µg/m^3	-- --	0.15 µg/m^3 1.5 µg/m^3
Hydrogen Sulfide	1-hour period	--	0.08 ppm	0.03 ppm	--
Visibility	Visibility Reducing Particles	Regional Visibility: (see note l) Sub-regional Visibility: (see note m)	In sufficient amount to reduce the prevailing visibility[i] to less than 30 miles when relative humidity is less than 70%	In sufficient amount to reduce the prevailing visibility[i] to less than 10 miles when relative humidity is less than 70%	--

Source: Fehr & Peers, 2009

Notes:

* TRPA references state and/or federal standards and does not specify their own.

a Nevada standard specific to the Lake Tahoe Air Basin (ozone) or areas at or above 5000 ft above mean sea level.

b Secondary standard.
c Not to be exceeded more than once per year.
d The 3-year average of the forth-highest daily maximum 8-hour average ozone concentrations measured within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).
e Not to be exceeded more than once per year on average over 3 years.
f The 3-year average of the 98th percentile of 24 –hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).
g The 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.
h The ambient air quality standard for hydrogen sulfide does not include naturally occurring background concentrations.
i For the purposes of this section, prevailing visibility means the greatest visibility which is attained or surpassed around at least half of the horizon circle, but not necessarily in continuous sectors.
j Second highest CO concentration measured at Stateline, CA air quality station.
k Not to be equaled or exceeded.
l Achieve an extinction coefficient of 25 Mm^{-1} at least 50% of the time as calculated from aerosol species concentrations measured at the Bliss State Park monitoring site (visual range of 156 km, 97 mi); and achieve an extinction coefficient of 34 Mm^{-1} at least 90% of the time as calculated from aerosol species concentrations measured at the Bliss State Park monitoring site (visual range of 115 km, 71 mi). Calculations will be made on 3-yr running periods using the existing 1991-1993 monitoring data as the performance standards to be met or exceeded.
m Achieve an extinction coefficient of 50 Mm^{-1} at least 50% of the time as calculated from aerosol species concentrations measured at the South Lake Tahoe monitoring site (visual range of 78 km, 48 mi); and achieve an extinction coefficient of 125 Mm^{-1} at least 90% of the time as calculated from aerosol species concentrations measured at the South Lake Tahoe monitoring site (visual range of 31 km, 19 mi).

ppm = parts per million
µg/m3 = micrograms per cubic meter

Table 4.9-4

TRPA Peak 24-Hour Period Significance Thresholds

Pollutant	Kilograms	Pounds
Nitrogen Dioxide	11.0	24.2
Particulate Matter Less Than 10 Microns	10.0	22.0
Volatile Organic Compounds (Reactive Organic Compounds)	57.0	125.7
Sulfur Dioxide	6.0	13.2
Carbon Monoxide	100.0	220.5

`Source: TRPA Code of Ordinances, Chapter 91 – Air Quality Control

EVALUATION CRITERIA WITH POINTS OF SIGNIFICANCE

Based on the TRPA Guidelines, a project impact is considered significant if conditions presented in Table 4.9-5 are met. Indicators/standards that are currently out-of-attainment are considered a significant impact if they are made worse by the Project.

Table 4.9-5

Evaluation Criteria with Points of Significance – Air Quality

Evaluation Criteria	As Measured By	Point of Significance	Justification
AIR-1. Will the Project result in temporary air quality impacts associated with construction activities?	Vehicle Miles of Travel	An increase of more than 1,150 VMT; and any unmitigated emissions of CO, O^3, & PM.	NSCP
AIR-2. Will the Project result in substantial air pollutant emissions from daily operations?	Vehicle Miles of Travel	An increase of more than 1,150 VMT; and any unmitigated emissions of CO, O^3, & PM.	NSCP
	Traffic Volumes	An increase of 100 or more new daily trips	TRPA Code of Ordinances
	Peak 24-hour period emissions for stationary sources: Nitrogen Oxide PM_{10} Volatile Organic Compounds Sulfur Dioxide Carbon Monoxide	 >3.0 kg or >6.6 lbs >2.0 kg or >4.4 lbs >8.0 kg or >17.6 lbs >3.0 kg or >6.6 lbs >10.0 kg or >22.0 lbs	TRPA Code of Ordinances
AIR-3. Will the Project result in the creation of objectionable odors?	Qualitative measurement of objectionable odors that can be detected by the average human.	Land use generates objectionable odors	

Source: Fehr & Peers, 2009

ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION

IMPACT: **AIR-1: Will the Project result in temporary air quality impacts associated with construction activities?**

Analysis: *No Impact; Alternatives A and B*

Alternative A will not include any changes to the existing Tahoe Biltmore site or structures; therefore, there are no impacts associated with this alternative. Alternative B will only include minor remodeling internal to the existing Tahoe Biltmore structures and the construction of up to three single family residences, and therefore, will not create a temporary air quality impact.

Mitigation: No mitigation is required.

Analysis: *Less than Significant Impact; Alternatives C, D and E*

Alternatives C, D and E will generate VMT and associated air quality emissions during construction. The grading phase of construction will generate the most construction-related traffic, and therefore the most construction-related VMT, due to the large amount of cut soil that will need to be removed from the project site. VMT for the construction phase of the Project was calculated using the net cut material (in cubic yards) for each alternative, the average long haul truck capacity (20 cubic yards per load), and the total number of grading days allowed by TRPA for the Lake Tahoe Basin (168 days). It was also assumed that the cut material will be taken from the project site to a location in Truckee via SR 267. The total round trip length was estimated to be 30 miles. Table 4.9-6 presents the daily VMT for the construction phase of each project alternative.

Table 4.9-6

Construction Phase VMT for Alternatives C, D and E

Alternative	Net Cut Material [1]	Truck Loads [2]	Loads per Day[3]	VMT[4]
C	121,000 cubic yards	6,050 loads	36	1080
D	133,000 cubic yards	6,650 loads	40	1200
E	109,000 cubic yards	5,450 loads	33	990

Source: Fehr & Peers, 2009

Notes:

[1] Approximate amount of net cut material to be hauled off-site.

[2] Long haul trucks would be capable of carrying 20 cubic yards of material.

[3] Loads per day based on 168 day grading period.

[4] VMT based on 30 mile round trip length.

Alternative C. Based on construction traffic information provided in the Transportation section of this report, construction vehicles are expected to temporarily generate 1,080 VMT per day during the site grading phase of construction for Alternative C (assumed to be one grading season). This does not exceed the maximum allowable 1,150 VMT by the North Stateline Community Plan, and therefore will not be a significant impact.

Alternative D. Based on construction traffic information provided in the Transportation section of this report, construction vehicles are expected to temporarily generate 1,200 VMT per day during the site grading phase of construction for Alternative D (assumed to be one grading season). This estimate exceeds the maximum allowable 1,150 VMT by the North Stateline Community Plan; however, it is a temporary condition that will only last a maximum of 168 days during a single calendar year, and is therefore not considered a significant impact.

Alternative E. Based on construction traffic information provided in the Transportation section of this report, construction vehicles are expected to temporarily generate 990 VMT per day during the grading phase of construction for Alternative D (assumed to be one grading season). This does not exceed the maximum allowable 1,150 VMT by the NSCP, and therefore will not be a significant impact.

Mitigation: No mitigation is required.

IMPACT: AIR-2: Will the Project result in substantial air pollutant emissions from daily operations?

Vehicle Miles of Travel

Analysis: *No Impact; Alternative A*

Alternative A will not include any changes to the existing land uses, densities, or roadway network; therefore, there are no impacts associated with this alternative.

It should be noted that the existing Tahoe Biltmore is currently operating at less than its full capacity. Based on the trip generation rates discussed in Chapter 4.8-3, Proposed Project Analysis Methodology, the Tahoe Biltmore hotel and casino facility is operating well below its capacity. As shown in Table 4.9-7, if the Tahoe Biltmore were operating at full operational capacity, the facility would generate 33,140 total VMT in the Lake Tahoe Basin using standard TRPA trip generation and trip length values.

Mitigation: No mitigation is required.

Analysis: *Significant Impact; Alternatives B and E*

Alternatives B and E will generate 12,535 and 17,751 new VMT compared to Alternative A, respectively, and therefore will result in a substantial increase in air pollutant emissions from daily operations. This impact is considered to be significant.

VMT calculations were conducted using the daily trip generation results (from Chapter 4.8 – Transportation, Parking, and Circulation) for each project alternative and average trip length numbers from the TRPA travel demand model (provided by TRPA staff). An average trip length of 4.42 miles was used for residential trips and 7.77 miles was used for visitor trips. Reasonable assumptions were made regarding the percentage of casino, restaurant, and retail trips associated with residential trip making versus visitor trip making. The following assumptions were made for each project land use, based on the general characteristics of the Project:

- Residential – 100% residential, 0% visitor
- Lodging – 0% residential, 100% visitor
- Casino – 50% residential, 50% visitor
- Office - 100% residential, 0% visitor
- Dining - 20% residential, 80% visitor
- Retail - 5% residential, 95% visitor

VMT was calculated for each project land use, accounting for internal capture, alternative modes of travel, and pass-by trips. VMT was also calculated for the existing Tahoe Biltmore based on the existing turning movement counts, and subtracted from the overall project VMT for each alternative.

Table 4.9-7 shows the VMT results for each project alternative. Detailed VMT calculations can be found in Appendix W.

Table 4.9-7

VMT Analysis Comparison by Alternative

Project Alternative	Project Alternative VMT	Comparison to Alternative A (Baseline Conditions)
A (No Project)	33,140[1]	**0**
B	45,675	**12,535**
C	23,185	**(-9,955)**
D	23,335	**(-9,805)**
E	50,891	**17,751**

Source: Fehr & Peers, 2009

Notes:

[1] VMT calculated using TRPA trip rate tables and average trip lengths from the TRPA travel demand model.

Mitigation: **AIR-2: Traffic and Air Quality Mitigation Program**

The Project proponent shall pay the appropriate air quality mitigation fee in accordance with Chapter 93 – Traffic and Air Quality Mitigation Program of the TRPA Code of Ordinances.

Potential, future projects within the NSCP area that could benefit from funds contributed to the Air Quality Mitigation Program include:

- Adding bicycle lanes to SR 28 through the NSCP area
- Expanding existing transit services
- Constructing new transit shelters and bus turnouts
- Providing connectivity between multi-use paths for bicycles and pedestrians through the NSCP area.

Note that the Alternative C and Alternative D include these onsite multi-modal improvements as part of the proposed project.

After Mitigation: *Less than Significant Impact; Alternatives B and E*

Implementation of mitigation measure AIR-2 will reduce the significant impact associated with increased VMT to a less than significant level.

Analysis: *Less than Significant Impact; Alternatives C and D*

As shown in Table 4.9-7, Alternatives C and D will generate less VMT than Alternative A (assuming full operational capacity). Alternative C generates 9,955 VMT less than Alternative A (the lowest of all of the project alternatives). Alternative D generates 9,805

VMT less than Alternative A. Therefore, this impact is considered to be beneficial and no Air Quality Mitigation Fee is required.

Mitigation: No mitigation is required.

Project Generated Emissions

Analysis: *No Impact; Alternative A*

Alternative A will not include any changes to the existing Tahoe Biltmore site or structures; therefore, there are no impacts associated with this alternative.

Mitigation: No mitigation is required.

Analysis: *Significant Impact; Alternatives B, D, and E*

Project generated emissions were calculated using Urbemis 2007 computer software. ROG, NO_X, CO, SO_2, and PM_{10} emissions were calculated for each of the project alternatives. Table 4.9-8 shows the analysis results for each alternative as compared to Alternative A (No Project). The Urbemis 2007 summary reports are provided in Appendix X.

Table 4.9-8

Summary Report for Summer Emissions (lbs/day) by Alternative

Total Area Source Emissions	ROG *	NO_X	CO	SO_2	PM_{10}
Alternative A	51.42	67.72	588.67	0.50	85.27
Alternative B	**(+26.11)**	**(+44.66)**	**(+203.56)**	(+0.12)	**(+34.73)**
Alternative C	(-5.48)	(-15.18)	(-149.55)	(-0.16)	(-22.26)
Alternative D	**(+8.22)**	(-7.13)	(-76.01)	(-0.08)	(-12.99)
Alternative E	**(+30.87)**	**(+35.55)**	**(+304.75)**	(+0.25)	**(+44.08)**

Source: Fehr & Peers, 2009

Notes:

* Reactive Organic Compounds, a subset of TOG, precursor to ozone – also referred to as reactive hydrocarbons.

Bold indicates emissions exceeding TRPA thresholds.

Alternative B proposes to modify some of the existing land uses of the Tahoe Biltmore. Alternative B will change the 92 hotel units in the Tahoe Biltmore to timeshare units, increase the casino floor area to 29,744 square feet, increase the comparison retail to 4,513 square feet and add 3 single family dwelling units to the project area. As shown in Table 4.9-8, Alternative B will exceed the emissions thresholds for NO_X and PM_{10}, and therefore cause a significant impact. Ozone is currently in non-attainment for the Lake Tahoe Basin, therefore the increase in ROG caused by the project will also cause a significant impact.

Alternative D causes an increase in ROG emissions. Since ozone is currently in non-attainment for the Lake Tahoe Basin, any increase in ROG caused by the project is considered a significant impact.

Alternative E proposes to construct new residential uses and modify existing operations of the Tahoe Biltmore, including expansion of the casino to the square footage certified by the NTRPA. As shown in Table 4.9-8, Alternative E will exceed the emissions thresholds for NO_X, CO, and PM_{10}, and increase the ROG emissions, causing a significant impact.

Mitigation: **AIR-2: Traffic and Air Quality Mitigation Program**

Implement the mitigation measure described above under Vehicle Miles Traveled.

After Mitigation: *Less than Significant Impact; Alternatives B, D, and E*

Implementation of mitigation measure AIR-2 will reduce the significant impact associated with increased air emissions to a less than significant level.

Analysis: *Less than Significant Impact; Alternative C*

As shown in Table 4.9-8, Alternatives C will not exceed TRPA emission thresholds or worsen pollutants that currently non-attainment. Therefore, the impact is considered to be less than significant.

Mitigation: No mitigation is required.

IMPACT: AIR-3: Will the Project result in the creation of objectionable odors?

Analysis: *Less than Significant Impact; All Alternatives*

"Objectionable odors" are subjective and can only be analyzed qualitatively. Alternatives A, B, C, D and E will not create significant impacts in regards to odor, as the land uses included in each alternative are not typically associated with repugnant smells.

During project construction, diesel exhaust from construction equipment will produce temporary odors; however they will quickly disperse and will not leave any residual effects.

Mitigation: No mitigation is required.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

IMPACT: AIR-C1: Will the Project result in substantial cumulative air pollutant emissions from daily operations?

Analysis: *No Impact; Alternative A*

Alternative A will not include any changes to the existing Tahoe Biltmore site or structures; therefore, there are no impacts associated with this alternative.

Mitigation: No mitigation is required.

Analysis: *Significant Impact; Alternatives B, D, and E*

Land use information for pending/approved projects in the North Lake Tahoe area was used to calculate cumulative plus project conditions emissions using Urbemis 2007 computer software. ROG, NO_X, CO, SO_2, and PM_{10} emissions were calculated for each

of the project alternatives. Table 4.9-9 shows the analysis results for each alternative as compared to Alternative A (No Project). The Urbemis 2007 summary reports are provided in Appendix X.

Table 4.9-9

Summary Report for Cumulative Summer Emissions (lbs/day) by Alternative

Total Area Source Emissions	ROG *	NO_X	CO	SO_2	PM_{10}
Alternative A (Baseline Condition)	171.21	174.04	1,467.59	1.22	212.65
Alternative B	**(+31.91)**	**(+71.8)**	**(+222.77)**	(+0.09)	**(+42.81)**
Alternative C	(-4.85)	(-13.56)	(-137.36)	(-0.11)	(-19.96)
Alternative D	**(+14.97)**	(-4.99)	(-60.56)	(-0.08)	(-13.36)
Alternative E	**(+26.22)**	(+23.98)	**(+208.4)**	(+0.15)	**(+27.23)**

Source: Fehr & Peers, 2009

Notes:

* Reactive Organic Compounds, a subset of TOG, precursor to ozone – also referred to as reactive hydrocarbons.

Bold indicates emissions exceeding TRPA thresholds.

As shown in Table 4.9-9, Alternative B will exceed the emissions thresholds for ROG, NO_X, CO, and PM_{10} under cumulative plus project conditions. Therefore, this impact is considered to be significant.

Alternative D will cause an increase in ROG emissions, causing a significant impact.

The analysis results in Table 4.9-9 show that Alternative E will exceed the emissions threshold for ROG, CO, and PM_{10} under cumulative plus project conditions causing a significant impact.

Mitigation: **AIR-C1: Traffic and Air Quality Mitigation Program**

The Project proponent shall pay the appropriate air quality mitigation fee in accordance with Chapter 93 – Traffic and Air Quality Mitigation Program of the TRPA Code of Ordinances.

Potential, future projects that could benefit from funds contributed to the Air Quality Mitigation Program include:

- Adding bicycle lanes to SR 28 through the NSCP area
- Expanding existing transit services
- Constructing new transit shelters and bus turnouts
- Providing connectivity between multi-use paths for bicycles and pedestrians through the NSCP area.

Note that the Alternative C and Alternative D include these onsite multi-modal improvements as part of the proposed project.

After Mitigation: *Less than Significant Impact; Alternatives B, D, and E*

Implementation of mitigation measure AIR-2 will reduce the significant impact associated with increased air emissions to a less than significant level.

Analysis: *Less than Significant Impact; Alternatives C*

As shown in Table 4.9-9, Alternatives C and D will not exceed TRPA emission thresholds. Therefore, the impact is considered to be less than significant.

Mitigation: No mitigation is required.

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