24.19 CHAPTER 19 - CLIMATE CHANGE

Sections 19.3 to 19.6, DEIR/EIS pages 19-18 through 19-56, FEIR/EIS pages 19-18 through 1968-: Revisions based on public comment and addition of Alternative 1A

19.3 EVALUATION CRITERIA WITH POINTS OF SIGNIFICANCE

19.3.1 Significance Criteria

Neither the PCAPCD nor the TRPA have quantitative thresholds for the evaluation of GHG emissions in CEQA documents. Therefore, Appendix G of the 2010 State CEQA Guidelines and guidance provided by PCAPCD and TRPA were used to evaluate significance. A discussion of whether emissions will result in a significant project-level impact is presented in section 19.4.2. However, because GHG emissions are most appropriately evaluated on a regional and global scale, project-level emissions are concluded to be less than significant. This approach is in accordance with the 2010 CEQA Guidelines, which requires the evaluation of significance be conducted on the cumulative level. The Project was therefore considered to have a significant cumulative impact on climate change if it were to:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

- Conflict with any applicable plan, policy, or regulation of an agency adopted for reducing GHG emissions.

As discussed in Chapter 12 (Air Quality), this EIR uses the baseline year of 2008 to evaluate impacts on air quality under CEQA. Specifically, estimated GHG emissions are compared to emissions under existing conditions without the ~~p~~Project to determine the significance of the ~~p~~Project's climate change impact. This approach complies with the intent of the *Communities for a Better Environment* by providing a CEQA determination based on the change from existing conditions. As mentioned in Chapter 12, utilizing existing conditions to estimate Project-generated emissions will likely overstate potential impacts to air quality and climate change.

Note that an evaluation of operational GHG-emissions generated by the Project under future year (2021) conditions was completed to satisfy TRPA requirements. The evaluation of future year (2021) operational emissions represents a more likely estimation of GHG and climate change impacts ~~from~~during~~ the~~ Project operation because it considers land uses and ~~air quality~~ regulations that ~~will~~are expected be in place when the Project is actually constructed.

Scientific studies (as best represented by the IPCC's periodic reports) demonstrate that climate change is already occurring due to past GHG emissions. Evidence concludes that global emissions must be reduced below current levels. Given the seriousness of climate change, the PCAPCD and TRPA have determined that for the purposes of this analysis, any substantial increase in HMR-generated GHG emissions under existing conditions relative to ~~existing conditions~~the No-Project (Alternative 2) would result in the Project having a "significant impact on the environment" (Finely, Chang, and Landry pers. comm.).

19.4 ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION

This section describes the Project's effects on GHGs and climate change. Consistent with Section 15064.4(a) of the 2010 CEQA Guidelines, it begins with a discussion of analysis limitations.

19.1.1 Analysis Limitations

This analysis utilizes PCAPCD and ARB recommended modeling procedures for the quantification of GHG emissions. Specific limitations must be understood to apply the conclusions of this report. This section briefly identifies those limitations. Additional data gaps and limitations on a sector-by-sector basis are provided in the impact analysis.

Lack of Detailed Information: Although considerable efforts were made to obtain activity data for the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 4, 5, and 6, in some cases, this data was unavailable and estimates had to be made. For example, expected demand for natural gas and electricity was only available for the Proposed Project (~~Alternative 1~~Alternative 1/1A). Given the similar land uses, these data were assumed to accurately represent Alternatives 3, 5, and 6. In addition, some of the data obtained were based on State averages projected to the local level because Project-specific information was unknown. In each of these cases, GHG estimates were made based on accepted information and methodologies.

Data Projections: Full build-out of the Project ~~will~~is assumed to occur in 2021[1].~~This analysis is based on Project operations at buildout, which is 2021.~~ Because specific information on the Project's uses (e.g. energy, vehicle trips, water, etc.) ~~in 2021~~ at build-out are~~is~~ not known, assumptions had to be made. These values were drawn from a number of sources, including Fehr & Peers, Beaudin and Ganze, and Snowmakers Inc. The emission estimates ~~for~~ for build-out conditions in both existing and future years ~~2021~~ were assumed to remain constant throughout the Project lifetime. This assumption was necessary based on the availability and reliability of long-term future data sets. It is important to note that estimates for ~~2021~~ build-out conditions will most likely not remain constant over time. For example, the number of guests may be reduced or increased by future unknown economic conditions. In addition, emissions associated with energy consumption and refrigerant use are based on emissions factors for the most recent year in which complete data is available~~ (2007)~~. Thus, GHG emissions generated by refrigeration and conditioning units, and natural gas and electricity consumption (including electricity required for wastewater and water usage), were~~ and are~~ assumed to remain constant ~~through~~ under existing (2008) and future (2021) years. However, it is likely emission factors will actually decrease over time as energy generators decrease their carbon content through efficiency measures and increased reliance on renewable energy sources.

Population Flux: Given the nature of the Project, population and employment at the resort will be seasonal, which would result in higher GHG emissions during the winter season and lower GHG emissions during the summer season. When possible, this seasonal flux in population was taken into account. For example, emissions from transportation were calculated using both summer and winter VMT. However, this approach could overestimate emissions associated with spring and fall conditions.

[1] The construction schedule has been revised since the original operational modeling was completed for the Project. It is anticipated that construction will now be finished 2022 and the build-out year changed to 2023. All assumptions used in the modeling are unaffected by the new schedule. Because vehicle emissions rates are expected to lessen in the future due to regulatory requirements and improvements in engine efficiency, the emissions modeling conducted for the Project under future-year conditions represents a conservative analysis.

In some cases, information was not available to calculate the emissions under both summer and winter conditions (e.g. water and sanitary sewer discharge). In these cases, the emissions under the peak population (i.e. winter conditions) were assumed to occur throughout the entire year. This assumption likely overestimates total annual emissions as summer conditions would result in lower emissions. In addition, implementation of the Project may result in minor increases in secondary vacation homes and associated emissions. However, it is currently unknown by what factor use of these homes will increase.

Qualitative Analyses: This report does not include a quantitative estimate of emissions from land use change, waste generation, embodied emissions, and increased use of recreational water craft and vacation homes. The following discussion provides a rational for omission of these sectors.

GHG emissions from land use change would occur with Project development. Land near the South Base area and Mid-Mountain Base area contains forested areas, which will be removed (Tirman pers. comm. (A)). According to Chapter 8 – Biological Resources, 193 trees have been identified for removal under Proposed Project (~~Alternative 1~~Alternative 1/1A) (please see Table 8-6). This forest cover serves as both a source and sink of GHGs. The decomposition of organic matter releases CO_2 on an annual basis. For example, it is estimated that 50% of the total biomass of a tree is carbon, which can be released when the tree dies or is burned (Climate Action Reserve 2009). However, existing vegetation continually sequesters carbon from the atmosphere, effectively serving as a GHG sink. Estimating emissions of these sources on a Project-specific level is far more uncertain and speculative than for other classes of emissions discussed above. Consequently, emissions resulting from land use change were not included in the Project's inventory data. It should be noted, however, that any sequestration potential lost because of the Project would be relatively minor in given the large number of trees within the Project area. In addition, Mitigation Measure BIO-10 requires the preparation of a Forest Plan, which will increase the overall health of the forest.

The deposition of solid waste generated by HMR into landfills will result in the production of CH_4 and CO_2 when anaerobic bacteria degrade the material (U.S. Environmental Protection Agency 2006b). Since CO_2 is produced during the natural degradation process, it is generally not considered in waste stream analyses. Rather, emissions of CH_4 are considered the primary result of land filling waste. An analysis of CH_4 emissions from the Project would require a detailed waste stream profile, which is beyond the scope of this document. Consequently, GHG emissions associated with waste generation were not estimated.

Embodied, or lifecycle, GHG emissions are created during the extraction, processing, transportation, construction, and disposal of building materials and during landscape disturbance or alteration of biomass (King County Department of Development and Environmental Services 2007). There is a large uncertainty involved in estimating the magnitude, sources, and signs (whether they are positive or negative; i.e., sources or sinks) of embodied emissions associated with aspects of a project. The California Air Pollution Control Officers Association (CAPCOA) recommends against including certain types of embodied emissions in GHG inventories due to the speculative nature of such analysis (California Air Pollution Control Officers Association 2008). For this reason, embodied GHG emissions were not included in the HMR GHG emissions inventory.

Implementation of the Project will increase tourism in the LTAB. While a large portion of incoming guests are expected to stay at HMR, it is likely that occupancy at local hotels and vacation homes will increase. With more tourists, use of recreational watercraft, such as boats and jet skis, may increase. While GHG emissions associated with these activities will be produced, it is not currently known by what factor use of watercraft and local hotels will increase because of the Project. A quantitative analysis of these emissions would therefore be considered speculative.

19.1.2 Climate Change Impacts on the Proposed Project

Climate change is a complex phenomenon that has the potential to alter local climatic patterns and meteorology. Although modeling studies indicate~~s~~ that climate change will result, among other things, in sea level rise and changes in regional climate and rainfall, a high degree of scientific uncertainty exists with regard to characterizing future climate characteristics and predicting how various ecological and social systems will respond to climate changes at the local level. Regardless of this uncertainty, it is widely understood that some form of climate change is expected to occur in the future. Consequently, the Project (Alternative 1/1A) and Alternatives 2, 3, 4, 5, and~~-~~ 6 may be impacted by changing climatic conditions.

Appendix G of the CEQA Guidelines does not include an entry for considering the effects of climate change on projects. However, the Guidelines state, "[t]he sample questions in this form are intended to encourage thoughtful assessment of impacts, and do not necessarily represent thresholds of significance." The absence of an issue from Appendix G does not mean that it may not be meaningful to a particular project and therefore worthy of analysis (*Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 117 Cal.App.4th 590). Therefore, for completeness and informational purposes, a brief summary of potential affects from anticipated regional changes in climate is provided below.

Several recent studies have attempted to characterize future climatic scenarios for the State. While specific estimates and statistics on the severity of changes vary, it is expected that Northern California will experience warmer temperatures, increased heat waves, and changes in rainfall patterns. Specifically, average annual temperatures are expected to increase 0.5°C to 1.5°C between 2005 and 2034, and up to 4.5 °C by 2099 (Cayan et al. 2008). Annual precipitation is expected to have a modest decline, but remain highly variable and subject to increase in large precipitation events. Warmer temperatures will cause more precipitation to fall as rain, resulting in decreased snow accumulation (-12% to -42% for 2035 to 2064). Heavier precipitation events coupled with earlier snowmelt and reduced annual rainfall may result in decreased stream flow and freshwater availability (Intergovernmental Panel on Climate Change 2007b; California Natural Resources Agency 2009; Cayan et. al. 2008; Howat and Tulaczky 2005; and Bates et. al. 2008.)

Climatic models predict that the frequency and magnitude of extreme events will increase over the next century. For example, the number of high-heat days will increase by more than 100 between 2035 and 2064, relative to the previous 30–-year period (2005 and 2034). Wildfire frequency and intensity is expected to increase as temperatures increase, vegetation dries, and soil moisture evaporates. The Lake Tahoe Area is expected to experience "high" to "very high" fire threats as a result of changing climatic conditions. (California Natural Resources Agency 2009; and Cayan et. al. 2008)

The Project area will likely be most affected by climatic changes that could reduce snowpack, increase wildfire~~life~~ risk, and compromise the structural integrity of HMR facilities. Such events include extreme heat, reduced annual precipitation, increased precipitation as rainfall, and earlier snowmelt. With reduced snowfall and accumulation, HMR may have to increase snowmaking operations, placing additional demand on electrical utilities and water resources. Extreme heat events and warmer annual temperatures may increase wildfire risk, which may threaten HMR facilities and human health due to exposure to smoke. Changes in soil moisture and extreme precipitation could also lead subsidence, which may cause portions of the Project area to become unlevel or hazardous.

Given the uncertainties associated with predicting specific future climatic conditions, the Project-level evaluation contained herein neither characterizes a future climatic condition nor analyzes ~~p~~Project-emissions within the context of a particular scenario. The GHG emissions estimates discussed below may therefore be influenced by climate change. For example, reduced snowfall and accumulation may increase water demand and electricity usage for snowmaking beyond the assumptions analyzed in this chapter. Likewise, extreme heat days may increase air conditioning and electricity usage. While changing climatic conditions may therefore affect operation of the Project, the severity of these changes is currently unknown.

19.1.3 Impacts

The cause of global climate change is generally accepted to be increased emission of GHGs from human activities, among other factors. Estimated HMR GHG emissions are minuscule in comparison to current and estimated future global GHG emissions. Attributing any observed climate change to HMR emissions is, therefore, speculative. The following discussion describes Project-level GHG emissions, while section 19-5 discuses Project GHG emissions in a cumulative context.

Impact: **CC-1. Will the Project Result in a Significant Project-Level Impact on Climate Change?**

Analysis: *No Impact; No Project (Alternative 2)*

No Project (Alternative 2) will not include any changes to the existing HMR Project area or structures. Therefore, there will be no additional GHG emitted with No Project (Alternative 2). There would therefore be no impact. No further analysis is required.

Mitigation: No mitigation is required.

Analysis: *Less than Significant Impact; Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 4, 5, and 6*

Project Construction

Construction emissions were calculated using the construction activity estimates and land use assumptions summarized in Chapter 12 - Air Quality and Appendix N. GHG emissions from construction activities are primarily the result of fuel use by construction equipment, as well as worker and vendor trips. It was assumed that construction of the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, and 6 would occur in four phases beginning in May 2011 and ending in December 2020.[2] Phases 1a and 1b/c will take approximately 5.5 years to complete and would include the construction of the North Base area and Mid-Mountain Base area. Phases 2a and 2b will take approximately 4.5 years and would include the construction of South Base area land uses. Construction of Alternative 4 is unknown since it would involve construction by others, but is assumed to be complete between May and October 2011 (see Appendix N for more information on assumptions).

The URBEMIS2007 model (version 9.2.4) was used to calculate CO_2 emissions associated with construction. URBEMIS2007 accounts for CO_2 emissions resulting from fuel use by construction equipment and worker commutes. Emission calculations were based on activity estimates and land use assumptions summarized in Chapter 12 – Air Quality and Appendix N. Equipment inventories, load factors, and horsepower (Hp) were based on default values generated by URBEMIS2007 for the specified land uses.

[2] The schedule has been revised since the original construction modeling was completed for the Project. It is anticipated that construction will now occur between 2013 and 2022. All phase durations and equipment assumptions used in the modeling are unaffected by the new schedule. Because equipment and vehicle emissions rates are expected to lessen in the future due to regulatory requirements and improvements in engine efficiency, the emissions modeling conducted for the Project represents a conservative analysis.

Appendix M summarizes the equipment assumptions used in the modeling. Complete URBEMIS2007 outputs are provided in Appendix O.

URBEMIS2007 does not quantify CH_4 and N_2O emissions, although construction equipment emits these two pollutants. CH_4 and N_2O emissions associated with construction emissions from off-road equipment were determined by scaling the construction CO_2 emissions predicted by URBEMIS2007 by the ratio of CH_4/CO_2 and N_2O/CO_2 emissions expected per gallon of diesel fuel according to the Climate Action Registry General Reporting Protocol Version 3.1 (California Climate Registry 2009). The California Climate Action Registry (CCAR) emission factor for CO_2 is 10.15 kilogram (kg) CO_2 per gallon of diesel fuel. Construction equipment using diesel fuel emits 0.58 gram CH_4 per gallon and 0.26 gram N_2O per gallon (California Climate Action Registry 2009). The ratios of CH_4 and N_2O to CO_2 per gallon of diesel fuel are 0.00006 and 0.00003, respectively. CO_2 emissions from off-road diesel sources (Appendix O) were multiplied by these ratios to estimate CH_4 and N_2O emissions from construction equipment operation. These emissions were then converted to CO_2e using the GWPs of each gas (Table 19-1).

Construction worker and vendor commutes produce GHGs. However, because employees typically commute in gasoline powered vehicles, the previous methodology for calculating CH_4 and N_2O from diesel-powered equipment is inappropriate. For on-road, gasoline powered vehicles, the EPA recommends if CH_4, N_2O, and HFC emissions account for 5% of total emissions, accounting for their GWPs (Environmental Protection Agency 2005). To quantify these GHGs, the annual CO_2 emissions from construction worker and vendor commutes (Appendix O) were therefore divided by 0.95.

Table 19-7 through Table 19-~~10~~ 12 list the annual GHG emissions that would be generated by construction of the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 4, 5, and 6. ~~Since the Proposed Project (Alternative 1Alternative 1/1A) and Alternative 3 do not differ with regards to land use assumptions, the number and types of construction equipment required would be the same. Consequently, GHG emissions generated by construction of the Proposed Project (Alternative 1Alternative 1/1A) and Alternative 3 will be similar. Likewise, for the purposes of this impact analysis, it is assumed that GHG emission estimates for Alternative 1 and Alternative 1A (both considered the Proposed Project) are quantitatively similar and would result in similar impacts. A separate quantitive analysis was not conducted to estimate the emissions of Alternative 1A. Qualitatively, with five more multi-family housing units, GHG emissions related to the construction and operation of Alternative 1 and expected to be slightly greater than Alternative 1A, but the impact conclusions and proposed mitigation measures would be the same and Alternative 1A is not expected to result in impacts other than those described for Alternative 1.~~

Table 19-7

Estimated GHG Emissions from Construction Activities for the Proposed Project (~~Alternative 1~~Alternative 1/~~1A~~) ~~and Alternative 3~~ (metric tons)

Year	Off-road Emissions[1]			On-Road Emissions[2]		Total Emissions (CO_2e)
	CO_2	CH_4	N_2O	CO_2	Other GHGs (CO_2e)	
2011	223~~140~~	0.013~~0.008~~	0.006~~0.004~~	75~~129~~	3.945~~6.780~~	303.73~~276.96~~
2012	303~~192~~	0.017~~0.011~~	0.008~~0.005~~	332~~332~~	17.460~~17.460~~	654.97~~542.88~~
2013	311~~203~~	0.018~~0.012~~	0.008~~0.005~~	329~~329~~	17.299~~17.299~~	659.76~~550.68~~
2014	109~~108~~	0.006~~0.006~~	0.003~~0.003~~	31~~31~~	1.611~~1.611~~	142.11~~141.22~~
2015	107~~106~~	0.006~~0.006~~	0.003~~0.003~~	73~~73~~	3.858~~3.858~~	185.30~~183.89~~
2016	115~~114~~	0.007~~0.006~~	0.003~~0.003~~	74~~74~~	3.893~~3.893~~	193.89~~192.51~~
2017	128~~108~~	0.007~~0.006~~	0.003~~0.003~~	28~~28~~	1.496~~1.496~~	159.12~~138.91~~
2018	145~~114~~	0.008~~0.007~~	0.004~~0.003~~	68~~68~~	3.602~~3.602~~	218.29~~187.06~~
2019	151~~140~~	0.009~~0.008~~	0.004~~0.004~~	35~~35~~	1.847~~1.847~~	189.07~~178.58~~
2020	215~~199~~	0.012~~0.011~~	0.006~~0.005~~	86~~86~~	4.512~~4.512~~	307.64~~291.49~~
Total	**1,807~~1,424~~**	**0.103~~0.081~~**	**0.046~~0.036~~**	**1,131~~1,185~~**	**59.522~~62.357~~**	**3,014~~2,684.00~~**

Source: URBEMIS2007; California Climate Action Registry 2009; Environmental Protection Agency 2005; Appendices M and N.

Notes:

1 From construction equipment (diesel).

2 From construction worker and vendor commutes (mix of fuels). Other GHGs include CH_4, N_2O, and HFCs, which represent 5% of total GHG emissions from on-road sources (calculated by dividing CO_2 emissions by 0.95 and multiplying the resulting number by 0.05).

Table 19-8

Estimated GHG Emissions from Construction Activities for Alternative 1A (metric tons)

Year	Off-road Emissions[1]			On-Road Emissions[2]		Total Emissions (CO_2e)
	CO_2	CH_4	N_2O	CO_2	Other GHGs (CO_2e)	
2011	195	0.011	0.005	76	3.977	276.33
2012	259	0.015	0.007	335	17.611	613.64
2013	268	0.015	0.007	331	17.447	619.57
2014	109	0.006	0.003	31	1.611	141.81
2015	107	0.006	0.003	73	3.858	184.82
2016	115	0.007	0.003	74	3.893	193.42
2017	121	0.007	0.003	28	1.496	152.45
2018	135	0.008	0.003	68	3.602	207.99
2019	114	0.006	0.003	33	1.743	149.56
2020	121	0.007	0.003	80	4.228	207.11
Total	**1,543**	**0.088**	**0.040**	**1,130**	**59.464**	**2,747**

Source: URBEMIS2007; California Climate Action Registry 2009; Environmental Protection Agency 2005; Appendices M and N.

Notes:

1 From construction equipment and haul trucks (diesel).

2 From construction worker and vendor commutes (mix of fuels). Other GHGs include CH_4, N_2O, and HFCs, which represent 5% of total GHG emissions from on-road sources (calculated by dividing CO_2 emissions by 0.95 and multiplying the resulting number by 0.05).

Table 19-9

Estimated GHG Emissions from Construction Activities for Alternative 3 (metric tons)

Year	Off-road Emissions[1]			On-Road Emissions[2]		Total Emissions (CO_2e)
	CO_2	CH_4	N_2O	CO_2	Other GHGs (CO_2e)	
2011	338	0.019	0.009	129	6.780	476.41
2012	505	0.029	0.013	332	17.460	858.37
2013	507	0.029	0.013	329	17.299	857.71
2014	109	0.006	0.003	31	1.611	142.68
2015	108	0.006	0.003	73	3.858	186.20
2016	116	0.007	0.003	74	3.893	194.77
2017	145	0.008	0.004	28	1.496	176.64
2018	172	0.010	0.004	68	3.602	245.37
2019	160	0.009	0.004	35	1.847	198.03
2020	229	0.013	0.006	86	4.512	321.43
Total	**2,389**	**0.136**	**0.061**	**1,185**	**62.357**	**3,658**

Source: URBEMIS2007; California Climate Action Registry 2009; Environmental Protection Agency 2005; Appendices M and N.

Notes:
[1] From construction equipment and haul trucks (diesel).
[2] From construction worker and vendor commutes (mix of fuels). Other GHGs include CH_4, N_2O, and HFCs, which represent 5% of total GHG emissions from on-road sources (calculated by dividing CO_2 emissions by 0.95 and multiplying the resulting number by 0.05).

Table 19-10

Estimated GHG Emissions from Construction Activities for Alternative 4 (metric tons)

Year	Off-road Emissions[1]			On-Road Emissions[2]		Total Emissions (CO_2e)
	CO_2	CH_4	N_2O	CO_2	Other GHGs (CO_2e)	
2011	112	0.006	0.003	5.082	0.267	119

Source: URBEMIS2007; California Climate Action Registry 2009; Environmental Protection Agency 2005; Appendices M and N.

Notes:
[1] From construction equipment (diesel).
[2] From construction worker and vendor commutes (mix of fuels). Other GHGs include CH_4, N_2O, and HFCs, which represent 5% of total GHG emissions from on-road sources (calculated by dividing CO_2 emissions by 0.95 and multiplying the resulting number by 0.05).

Table 19-11

Estimated GHG Emissions from Construction Activities for Alternative 5 (metric tons)

Year	Off-road Emissions[1]			On-Road Emissions[2]		Total Emissions (CO_2e)
	CO_2	CH_4	N_2O	CO_2	Other GHGs (CO_2e)	
2011	301 ~~140~~	0.017 ~~0.008~~	0.008 ~~0.004~~	96 ~~96~~	5.051 ~~5.051~~	404.58 ~~242.39~~
2012	446 ~~192~~	0.025 ~~0.011~~	0.011 ~~0.005~~	245 ~~245~~	12.901 ~~12.901~~	708.25 ~~451.70~~
2013	448 ~~201~~	0.026 ~~0.011~~	0.011 ~~0.005~~	243 ~~243~~	12.804 ~~12.804~~	708.47 ~~458.80~~
2014	142 ~~140~~	0.008 ~~0.008~~	0.004 ~~0.004~~	114 ~~114~~	5.981 ~~5.981~~	262.63 ~~261.26~~
2015	194 ~~192~~	0.011 ~~0.011~~	0.005 ~~0.005~~	294 ~~294~~	15.499 ~~15.499~~	505.84 ~~503.67~~
2016	206 ~~203~~	0.012 ~~0.012~~	0.005 ~~0.005~~	292 ~~292~~	15.372 ~~15.372~~	514.90 ~~512.79~~
2017	108 ~~108~~	0.006 ~~0.006~~	0.003 ~~0.003~~	4 ~~4~~	0.202 ~~0.202~~	113.03 ~~113.03~~
2018	114 ~~114~~	0.006 ~~0.006~~	0.003 ~~0.003~~	4 ~~4~~	0.199 ~~0.199~~	118.57 ~~118.57~~
2019	68 ~~68~~	0.004 ~~0.004~~	0.002 ~~0.002~~	3 ~~3~~	0.164 ~~0.164~~	72.19 ~~72.19~~
2020	0 ~~0~~	0.000 ~~0.000~~	0.000 ~~0.000~~	0 ~~0~~	0.000 ~~0.000~~	0.00 ~~0.00~~
Total	**2,026 ~~1,359~~**	**0.116 ~~0.078~~**	**0.052 ~~0.035~~**	**1,295 ~~1,295~~**	**68.172 ~~68.172~~**	**3,408 ~~2,734~~**

Source: URBEMIS2007; California Climate Action Registry 2009; Environmental Protection Agency 2005; Appendices M and N.

Notes:

1 From construction equipment (diesel).

2 From construction worker and vendor commutes (mix of fuels). Other GHGs include CH_4, N_2O, and HFCs, which represent 5% of total GHG emissions from on-road sources (calculated by dividing CO_2 emissions by 0.95 and multiplying the resulting number by 0.05).

Transportation

Traffic CO_2 emissions under existing (2008) and future year (2021) conditions were estimated using URBEMIS2007 and the traffic data provided by Fehr & Peers (Harned pers. comm. (A) and (B)). Detailed traffic information is provided in Chapter 11 – Transportation, Parking, and Circulation. URBEMIS2007 estimates mobile source emissions based on the vehicular emissions typically associated with the proposed land uses. URBEMIS2007 utilizes the latest emission rate program to produce emissions estimates. The traffic data used in this analysis does not account for reductions from alternative modes of transportation. These reductions will be discussed in Section 19-5. Trip rates were adjusted to account for internal trips completed by guests already at HMR. Data for the adjustment calculations were provided by Fehr & Peers (Harned pers. comm. (A) and (B)). Appendix P contains the trip generation rates used in the modeling.

The traffic data provided by Fehr & Peers indicated that VMT would be higher during the winter ski season than summer months. Consequently, summer and winter mobile emissions were modeled separately and then combined to obtain total yearly emissions.[3]

Table 19-12

Estimated GHG Emissions from Construction Activities for Alternative 6 (metric tons)[1]

Year	Off-road Emissions[1]			On-Road Emissions[2]		Total Emissions (CO_2e)
	CO_2	CH_4	N_2O	CO_2	Other GHGs (CO_2e)	
2011	290~~140~~	0.017~~0.008~~	0.007~~0.004~~	92~~92~~	4.859~~4.859~~	389.65~~238.55~~
2012	235~~192~~	0.013~~0.011~~	0.006~~0.005~~	235~~235~~	12.394~~12.394~~	485.50~~441.56~~
2013	431~~201~~	0.025~~0.011~~	0.011~~0.005~~	234~~234~~	12.304~~12.304~~	681.35~~448.70~~
2014	142~~140~~	0.008~~0.008~~	0.004~~0.004~~	74~~74~~	3.912~~3.912~~	221.17~~219.89~~
2015	194~~192~~	0.011~~0.011~~	0.005~~0.005~~	190~~190~~	9.989~~9.989~~	395.47~~393.45~~
2016	203~~201~~	0.012~~0.012~~	0.005~~0.005~~	189~~189~~	9.937~~9.937~~	403.83~~401.86~~
2017	108~~108~~	0.006~~0.006~~	0.003~~0.003~~	4~~4~~	0.202~~0.202~~	113.03~~113.03~~
2018	114~~114~~	0.006~~0.006~~	0.003~~0.003~~	4~~4~~	0.199~~0.199~~	118.57~~118.57~~
2019	118~~108~~	0.007~~0.006~~	0.003~~0.003~~	28~~28~~	1.458~~1.458~~	148.17~~138.16~~
2020	128~~113~~	0.007~~0.006~~	0.003~~0.003~~	66~~66~~	3.482~~3.482~~	198.36~~183.32~~
Total	**1,962~~1,509~~**	**0.112~~0.086~~**	**0.050~~0.039~~**	**1,116~~1,116~~**	**58.735~~58.735~~**	**3,155~~2,697~~**

Source: URBEMIS2007; California Climate Action Registry 2009; Environmental Protection Agency 2005; Appendices M and N.

Notes:
1 From construction equipment (diesel).
2 From construction worker and vendor commutes (mix of fuels). Other GHGs include CH_4, N_2O, and HFCs, which represent 5% of total GHG emissions from on-road sources (calculated by dividing CO_2 emissions by 0.95 and multiplying the resulting number by 0.05).

Based on information from Fehr & Peers, summer time traffic in Tahoe goes from June through September, with peak traffic usually occurring in August. Winter time traffic goes from December through March (Harned pers. comm. (C)). Fehr & Peers developed traffic counts for each season through comprehensive evaluation of the land uses and the

[3] It is likely that VMT during the spring and fall seasons would be less than VMT during summer and winter. This assumption therefore provides a conservative analysis in that it may overestimate actual annual emissions from transportation.

interaction between the Proposed Project (~~Alternative 1~~Alternative 1/1A) and surrounding community (Fehr & Peers 2009). For ease of analysis, each season was assumed to be 182.5 days. Complete model outputs are provided in Appendix L.

CH_4 emissions from transportation were estimated using the EMFAC2007 model. The vehicle fleet profile and VMT generated by the URBEMIS2007 simulations were used to calculate total CH_4 emissions based on the EMFAC2007 running exhaust and starting emissions factors. Since URBEMIS2007 provides fleet data in five-year increments, the year 2020 was used ~~in this~~for the future year (2021) analysis. Table 19-~~11~~13 describes the fleet profile used for the existing (2008) and future year (2021) analyses.~~in this analysis~~.

Table 19-13

Fleet Profile by Vehicle Class

Vehicle Class	Percent Vehicle Type (Existing [2008] Conditions)	Percent Vehicle Type (Future [2021] Conditions)
Light Auto	32.6	32.7
Light Truck 1	24.6	24.3
Light Truck 2	19.6	19.8
Medium Truck	9.1	9.2
Light Heavy Duty Truck 1	2.5	2.5
Light Heavy Duty Truck 2	1.2	1.2
Medium Heavy Duty Truck	0.8	0.9
Heavy Duty Truck	1.0	0.8
Line Haul	0.1	0.1
Urban Bus	0.0	0.0
Motorcycle	6.4	6.4
School Bus	0.1	0.1
Motor Home	2.0	2.0
Total	**100.0**	**100.0**

Source: URBEMIS2007.

Emissions of N_2O were calculated using the fleet information in Table 19-~~11~~13 and the EMFAC model. EMFAC produced estimates of miles traveled per gallon of fuel by vehicle type for gasoline and diesel in 2008 and 2021. Annual fuel use by vehicle type was then used to determine N_2O emissions per gallon of fuel using the ARB 2006 emission factors for diesel and gasoline, which represent the most recent year of available data. The ARB emission factors for 2006 were 0.332 grams of N_2O per gallon of diesel for all vehicle types and 0.668, 0.661, 1.36 and 2.38 grams N_2O per gallon of gasoline for passenger cars, light duty trucks, heavy duty trucks, and motorcycles, respectively (California Air Resources Board 2009b-h). Emissions of N_2O per gallon of fuel used were assumed to remain constant over time to represent a worst-case emissions scenario. EMFAC outputs are attached in Appendix DD.

GHG emissions from the two (2) hybrid-diesel water taxis proposed under the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, and 6 were estimated using the ARB's OFFROAD2007 emission model. OFFROAD calculates emissions based on technology types, seasonal conditions, proposed regulations, and activity assumptions. For the purposes of this analysis, it was assumed that each water taxi would have twin 225 Hp diesel engines, and that hybrid power would reduce emissions by 70% (please refer to Air Quality Chapter 12.3 for an expanded discussion of these assumptions). Emissions were calculated using the equation presented in Air Quality Chapter 12.3. Emissions calculations are summarized in Appendix Q.

GHG emissions from transportation sources are presented in Tables 19-~~12~~14 and 19-15. ~~Since t~~The Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3 do not differ with regard to traffic volumes. ~~and land use patterns,~~ Additionally, the Project and Alternative 3 contain identical land-use patterns; Alternative 1A is similar to the Project, but includes four fewer residential condos. Where appropriate, the Project and Alternatives 1A and 3 are therefore analyzed as a single unit.[4] they were analyzed as a single unit (Harned pers. comm. (A)). These emissions represent a conservative estimate of Project-related emissions because the emission factors produced by EMFAC2007 do not include the reductions in mobile-source GHG emissions that would result from implementation of AB 1493 or AB 32. For these reasons, the emissions from transportation presented for both existing (2008) and future year (2021) conditions ~~in this analysis~~ are likely an overestimate.

Area Sources

URBEMIS2007 (version 9.2.4) was used to calculate operational GHG emissions. URBEMIS2007 accounts for CO_2 emissions resulting from stationary and area sources and from landscaping activities. Emission calculations were based on URBEMIS2007 defaults for the land use type and size summarized in Table 12-8. Existing sources emitting CO_2 at HMR are landscaping activities, wood hearth combustion (existing conditions only), natural gas combustion, and diesel back-up generators for the chairlifts. According to JMA Ventures, LLC, two (2) wood stoves currently operate at HMR for 120 days per year. These devices would not be included in the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 4, 5, and 6 (Tirman pers. comm. (A)). Landscape emissions are based on the URBEMIS2007 default summer length of 180 days.

NV Energy will supply natural gas to HMR. To obtain a more specific estimate of GHG emissions, natural gas combustion was calculated independent of the URBEMIS2007 model using consumption rates provided by Beaudin Ganze Inc., JMA Ventures, LLC, and the EIA (Beaudin Ganze 2007; Tirman pers. comm. (B); EIA 2009b and 2009c). GHG emission factors for CO_2, CH_4, and N_2O were obtained from NV Energy and CCAR (Soyars pers. comm.; California Climate Action Registry 2009). These emissions are included in the "Electricity and Natural Gas Use" section.

GHG emissions from existing landscaping activities and wood stoves were estimated using URBEMIS2007. Emissions of CH_4 and N_2O were not estimated because URBEMIS2007 is not able to calculate these emissions and any other reliable methodology is currently unavailable. However, area source emissions of CH_4 and N_2O

[4] Note that because Alternative 1A includes four fewer residential condos than the Project, emissions generated by this Alternative 1A may be slightly lower than those estimated using land use assumptions for the Project. The analysis contained herein for Alternative 1A should therefore be considered conservative.

emissions are expected to be trivial compared to tailpipe and energy related to GHG emissions. The area source URBEMIS2007 output is provided in Appendix O.

Table 19-14

Annual Mobile Source Emissions from Transportation under Existing (2008) Conditions (metric tons)[1]

Scenario	CO_2	CH_4	N_2O	Total CO_2e
Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3				
On-Road Traffic	1,844	0.280	0.161	1,900
Water Taxi	10	0.005	0.000	10
No Project (Alternative 2)[2]				
On-Road Traffic	987	0.160	0.091	1,018
Alternative 4[2]				
On-Road Traffic	399	0.062	0.034	411
Alternative 5[3]				
On-Road Traffic	1,671	0.258	0.145	1,722
Water Taxi	10	0.005	0.000	10
Alternative 6				
On-Road Traffic	1,627	0.251	0.141	1,676
Water Taxi	10	0.005	0.000	10

Source: URBEMIS2007; EMFAC2007; California Air Resources Board 2009b-h; Harned pers. comm. (A) and (B); OFFROAD2007.

Notes:

1 Daily traffic emissions from the winter and summer seasons were multiplied by 182.5.

2 No water taxis are proposed under No Project (Alternative 2) and Alternative 4.

3 As discussed in Chapter 12, the summer VMT estimates for Alternative 5 did not include trips associated with the 12 workforce housing units (estimated to equal about 25 total daily trips). The emissions presented above will therefore be slightly higher with the inclusion of these units.

Table 19-15

Annual ~~(2021)~~ Mobile Source Emissions from Transportation under Future Year (2021) Conditions (metric tons)[1]

Scenario	CO_2	CH_4	N_2O	Total CO_2e
~~Existing (2008)~~				
~~On-Road Traffic~~	~~987~~	~~0.160~~	~~0.091~~	~~1,018~~
Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3				
On-Road Traffic	1,845	0.135	0.156	1,896
Water Taxi	10~~7~~	0.005~~0.003~~	0.000~~0~~	10~~7~~
No Project (Alternative 2)[2]				
On-Road Traffic	981	0.081	0.088	1,010
Alternative 4[2]				
On-Road Traffic	400	0.030	0.033	411
Alternative 5[3]				
On-Road Traffic	1,671	0.124	0.140	1,717
Water Taxi	10~~7~~	0.005~~0.003~~	0.000~~0~~	10~~7~~
Alternative 6				
On-Road Traffic	1,626	0.121	0.137	1,671
Water Taxi	10~~7~~	0.005~~0.003~~	0.000~~0~~	10~~7~~

Source: URBEMIS2007; EMFAC2007; California Air Resources Board 2009b-h; Harned pers. comm. (A) and (B); OFFROAD2007.

Notes:

1 Daily traffic emissions from the winter and summer seasons were multiplied by 182.5.

2 No water taxis are proposed under No Project (Alternative 2) and Alternative 4.

3 As discussed in Chapter 12, the summer VMT estimates for Alternative 5 did not include trips associated with the 12 workforce housing units (estimated to equal about 25 total daily trips). The emissions presented above will therefore be slightly higher with the inclusion of these units.

CO_2 emissions from the five back-up diesel generators for the chairlifts were estimated using URBEMIS2007 and information provided by JMA Ventures, LLC (Tirman pers. comm. (C)). The URBEMIS2007 technical appendix provides default emission factors. The CO_2 factor remains constant regardless of the year or engine horsepower and is 420.920 grams/break horsepower-hours (Jones and Stokes 2007). CO_2 emissions were calculated using the equation presented in section 12-3. It was assumed that the generators would operate for 48 hours per year (Tirman pers. comm. (C)). No generators were assumed to operate under Alternative 4. Emissions of CH_4 and N_2O were calculated using the ratios of CH_4 and N_2O to CO_2 per gallon of diesel fuel described above. Emissions calculations are presented in Appendix R.

Tables 19-16 and 19-17 ~~3~~ presents the annual area source GHG emissions during Project operation under existing (2008) and future year (2021) conditions, respectively. Since the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3 do not differ with regard to land use patterns, they were analyzed as a single unit.[5]

High Global Warming Potential Gases

The CEC estimates that California emissions of HGWPGs are largely the result of refrigerants and, to a lesser extent, electric utility transmission and distribution equipment (California Energy Commission 2006a). According to the EIA, HGWPG emissions for 2007 accounted for 2.4% of total emissions (Energy Information Administration 2008). HGWPG emissions in the Project area are predominantly associated with refrigerants, air conditioning (AC), and transmission lines. Emissions of SF_6 from transmission lines resulting from electricity transmission and distribution are included in the electricity emissions analysis below.

Refrigerants and AC are sources of HFCs. HFCs are used as substitute refrigerants for chlorofluorocarbons (CFCs) that have been phased out of use under the Montreal Protocol. GHG emissions from refrigerants and AC were calculated for the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 4, 5, and 6 using recent studies of HFC sources and GHG inventories of HFCs from refrigeration and AC equipment, as well as documented refrigerant types, GWPs, charge sizes, and leak rates (Intergovernmental Panel on Climate Change/Technology & Economic Assessment Panel 2005; World Bank 2007; United Nations Environment Programme 2006). Table 19-~~14~~ 18 and Table 19-~~15~~ 19 present the assumptions regarding HFC usage based on the Project building type.

The assumptions presented in Table 19-~~14~~ 18 and Table 19-~~15~~ 19 were used to determine annual emissions of HFCs from Project operation under existing (2008) and future year (2021) conditions. Annual emissions by building type were calculated by multiplying the number of equipment pieces by the charge size, leak rate, and GWP of the associated HFC refrigerant installed in both refrigeration and AC units. It was assumed that residential land uses would have the same number of refrigerators. AC to these units would be supplied by centralized air, except in the 16 townhomes in the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3, which would have individual AC units (Tirman pers. comm. (D)). It was assumed that the hotel would have ice and vending machines on each floor). No AC is planned in the workforce housing units (the Proposed Project [~~Alternative 1~~Alternative 1/1A] and Alternatives 3, 5, and 6) or maintenance facilities (Tirman pers. comm. (D)). One general supermarket was assumed to operate at the North Base area and Mid-Mountain Base area.

Refrigeration and air conditioning leak rates and charge sizes were assumed to remain constant between 2008 and 2020. Estimated annual emissions ~~are~~ presented in Table 19-~~16~~18 therefore represent both the existing (2008) and future year (2021) conditions.

[5] Note that because Alternative 1A includes four fewer residential condos than the Project, emissions generated by this Alternative 1A may be slightly lower than those estimated using land use assumptions for the Project. The analysis contained herein for Alternative 1A should therefore be considered conservative.

Table 19-16

Annual Area Source GHG Emissions under Existing (2008) Conditions (metric tons)

Scenario/Source	CO_2	CH_4[1]	N_2O[1]	CO_2e
Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3[2]				
Landscape	1.35	N/A	N/A	1.35
Diesel Generator [3]	16.13	0.0009	0.0004	16.28
No Project (Alternative 2)				
Hearth[4]	9.67	N/A	N/A	9.67
Landscape	0.45	N/A	N/A	0.45
Diesel Generator[3]	16.13	0.0009	0.0004	16.28
Alternative 4[2, 5]				
Landscape	0.54	N/A	N/A	0.54
Alternative 5[2]				
Landscape	1.44	N/A	N/A	1.44
Diesel Generator[3]	16.13	0.0009	0.0004	16.28
Alternative 6[2]				
Landscape	1.20	N/A	N/A	1.20
Diesel Generator[3]	16.13	0.0009	0.0004	16.28

Source: Tirman pers. comm. (C); URBEMIS2007; Jones & Stokes 2007.

Notes:

1 Area source CH_4 and N_20 emissions for landscape and wood hearth unavailable

2 No wood hearth sources were assumed under the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 4, 5, and 6.

3 Five diesel generators operating for 48 hours per year were assumed.

4 Two wood stoves operating for 120 days per year were assumed.

5 No diesel generators would operate under Alternative 4.

Table 19-17

Annual ~~(2021)~~ Area Source GHG Emissions under Future Year (2021) Conditions (metric tons)

Scenario/Source	CO_2	CH_4[1]	N_2O[1]	CO_2e
Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3[2]				
Landscape	1.38	N/A	N/A	1.38
Diesel Generator [3]	16.13	0.0009	0.0004	16.28
No Project (Alternative 2)				
Hearth[4]	9.67	N/A	N/A	9.67
Landscape	0.46	N/A	N/A	0.46
Diesel Generator[3]	16.13	0.0009	0.0004	16.28
Alternative 4[2, 5]				
Landscape	0.55	N/A	N/A	0.55
Alternative 5[2]				
Landscape	1.47	N/A	N/A	1.47
Diesel Generator[3]	16.13	0.0009	0.0004	16.28
Alternative 6[2]				
Landscape	1.23	N/A	N/A	1.23
Diesel Generator[3]	16.13	0.0009	0.0004	16.28

Source: Tirman pers. comm. (C); URBEMIS2007; Jones & Stokes 2007.

Notes:

1 Area source CH_4 and N_20 emissions for landscape and wood hearth unavailable

2 No wood hearth sources were assumed under the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 4, 5, and 6.

3 Five diesel generators operating for 48 hours per year were assumed.

4 Two wood stoves operating for 120 days per year were assumed.

5 No diesel generators would operate under Alternative 4.

Table 19-18

Assumptions for Annual Project-Related Emissions of HFCs from Refrigeration (metric tons)

Building Type	Number	Equipment Type	Unit	Refrigerant	GWP	Charge Size (kg)	Leak Rate (%)	Annual Emissions per Unit (CO_2e)
Condo	1	refrigerators/freezers	unit	R-134a	1,430	0.10	0.90	0.001
Townhouse	1	refrigerators/freezers	unit	R-134a	1,430	0.10	0.90	0.001
Apartment	1	refrigerators/freezers	unit	R-134a	1,430	0.10	0.90	0.001
Supermarket	1	large parallel unit (DX)	supermarket	R-404A/R-507A	3,953.3	1,800.00	10.00	711.594
	12	stand alone units	supermarket	R-404A/R-507A	3,953.3	0.60	0.90	0.256
	35	display cases	supermarket	R-404A/ R-507A	3,953.3	0.50	0.90	0.623
	15	walk-in refrigerators	supermarket	R-404A/R-507A	3,953.3	3.00	8.00	14.232
	35	cold storage room	supermarket	R-404A/ R-507A	3,953.3	3.00	8.00	33.208
High Turnover Restaurant	6	stand alone units	restaurant	R-404A/R-507A	3,953.3	0.60	0.90	0.128
	2	cold storage room	restaurant	R-404A/ R-507A	3,953.3	3.00	8.00	8.539
	2	refrigerators/freezers	restaurant	R-134a	1,430.0	0.25	0.90	0.006
Single Family Home	1.6	refrigerators/freezers	house	R-134a	1,430	0.1	0.90	0.002
Hotel	1	small refrigerator	room[1]	R-134a	1,430.0	0.05	0.90	0.075
	9	stand alone units	hotel	R-404A/R-507A	3,953.3	0.60	0.90	0.192
	9	cold storage room	hotel	R-404A/ R-507A	3,953.3	3.00	8.00	8.539
	1	ice machine	floor [2]	R-134a	1,430.0	0.10	0.90	0.002
	4	refrigerators/freezers	hotel	R-134a	1,430.0	0.10	0.90	0.005
	1	vending machine	floor [2]	R-134a	1,430.0	0.60	0.90	0.016
Stand Alone Lodge	1	vending machine	lodge	R-134a	1,430.0	0.60	0.90	0.008
Detached Services Building [3]	–	–	–	–	–	–	–	–
General Office Building	1	refrigerators/freezers	per floor [2]	R-134a	1,430.0	0.10	0.90	0.002

Source: Chapter 3; Intergovernmental Panel on Climate Change/Technology & Economic Assessment Panel 2005; World Bank 2007; United Nations Environment Programme 2006

Notes

1 Assumed 75 rooms under Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3.

2 Assumed 2 floors.

3 No refrigerant usage assumed in the detached skier services buildings.

Table 19-19

Assumptions for Annual Project-Related Emissions of HFCs from Air Conditioning (metric tons)

Building Type	Number	Equipment Type	Unit (per)	Refrigerant	GWP	Charge Size (kg)	Leak Rate (%)	Annual Emissions per Unit (CO_2e)
Condo/Mixed Use	1	centrifugal chiller	building	R-134a	1,430	450	1.00	6.435
Townhouse	1	commercial unitary AC	unit	R-410A	2,087.5	10	4.00	0.835
Apartment[1]	–	–	–	–	–	–	–	–
Supermarket	1	screw or scroll chiller	market	R-134a	1,430	200	1.00	2.86
High Turnover Restaurant	1	commercial unitary AC	restaurant	R-410A	2,087.5	10	4.00	0.835
Single Family Home	1	residential unitary AC	house	R-410A	2,087.5	2	4.00	0.167
Hotel	1	centrifugal chiller	hotel	R-134a	1,430	450	1.00	6.435
Stand Alone Lodge	1	centrifugal chiller	building	R-134a	1,430	450	1.00	6.435
Detached Services Building	1	commercial unitary AC	building	R-410A	2,087.5	10	4.00	0.835
General Office Building	1	centrifugal chiller	building	R-134a	1,430	450	1.00	6.435

Source: Chapter 3; Intergovernmental Panel on Climate Change/Technology & Economic Assessment Panel 2005; World Bank 2007; United Nations Environment Programme 2006.

Notes

1 No AC planned for the workforce housing units.

Table 19-20

Annual ~~(2021)~~ Project-Related Emissions of HFCs from Refrigeration and Air Conditioning under Existing (2008) and Future Year (2021) Conditions (metric tons)

Building Type with AC/Refrigeration	Total Annual Emissions per Building Type	Number of Each Building Type	Total Annual Emissions (CO_2e)[1]
Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3			
Condo/Mixed Use	6.436	155 ~~units[1]~~units[2], 7 buildings[3]~~[2]~~	45.200
Townhouse	0.836	16 units	13.381
Apartment	0.001	13 units	0.017
Supermarket	762.772	1[4]~~[3]~~	762.772
High Turnover Restaurant	9.509	2[5]~~[4]~~	19.017
Hotel	15.264	1[6]~~[5]~~	15.264
Mid-Mountain Base Area Lodge	6.443	1	6.443
Detached Services Building	0.835	0	0
Total Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3	**N/A**	**N/A**	**862**
No Project (Alternative 2)			
High Turnover Restaurant	9.509	2[7]~~[6]~~	19.017
South Base Area and North Base Area Lodges	6.443	2	12.885
Detached Services Building	0.835	1	0.835
Total Alternative 2	**N/A**	**N/A**	**33**
Alternative 4			
Single Family Home	0.169	16[8]~~[7]~~	2.705
General Office Building	6.437	1~~[8]~~	6.437
Total Alternative 4	**N/A**	**N/A**	**9**
Alternative 5			
Condo/Townhouse	6.436	225 units; 3 buildings	19.530
Supermarket	762.772	1[4]~~[3]~~	762.772
Apartment	0.001	12 units	0.015
High Turnover Restaurant	9.509	2[5]~~[4]~~	19.017
Single Family Home	0.169	16[8]~~[7]~~	2.705
Hotel	15.264	1	15.264
Mid-Mountain Base Area Lodge	6.443	1	6.443
Detached Services Building	0.835	1	0.835
Total Alternative 5	**N/A**	**N/A**	**827**
Alternative 6			
Condo/Townhouse	6.436	195 units; 3 buildings	19.500

Building Type with AC/Refrigeration	Total Annual Emissions per Building Type	Number of Each Building Type	Total Annual Emissions (CO_2e)[1]
Supermarket	762.772	12 units	0.015
Apartment	0.001	1 [~~(1)~~2]	762.772
High Turnover Restaurant	9.509	2 [(3~~2~~)]	19.017
Single Family Home	0.169	14 [(4~~3~~)]	2.367
Hotel	15.264	1	15.264
Mid-Mountain Base Area Lodge	6.443	1	6.443
Detached Services Building	0.835	1	0.835
Total Alternative 6	**NA**	**NA**	**826**

Source: Chapter 3; Table 19-13 and Table 19-14.

Notes:

[1] Emission factors and consumption assumed to remain constant between 2008 and 2021.

[2~~1~~] Includes 135 residential condos and 20 fractional units.

[3~~2~~] Includes buildings A, C, D, and E at the North Base area, and buildings A1, A, and B at the South Base area.

[4~~3~~] One general supermarket assumed to be included at the North Base area.

[5~~4~~] One restaurant/bar assumed to be included at the North Base area and Mid-Mountain Base area.

[6~~5~~] The 30 penthouse condos would be located in the hotel building (Building B).

[7~~6~~] Two restaurants assumed to be included at the North Base area and South Base area.

[8~~7~~] Assumed that one single family home would be constructed on each of the 16 residential lots.

Electricity and Natural Gas Usage

Residential, commercial, and recreational electricity consumption was estimated using a variety of resources and methodologies, which are described below. In 2007, Beaudin Ganze Inc. completed a natural gas and electric energy use estimates for the Proposed Project (~~Alternative 1~~Alternative 1/1A) (Beaudin Ganze Inc. 2007). According to JMA Ventures, LLC, these estimates accurately represent consumption patterns for Alternatives 3, 5, and 6 given the similar land uses (refer to Table 12-8 in Chapter 10) (Tirman pers. comm. (E)). Electricity and natural gas consumption for No Project (Alternative 2) was provided by JMA Ventures, LLC (Tirman pers. comm. (B)). Electricity and natural gas consumption for Alternative 4 was not provided. This data was therefore estimated from 2007 average consumptive data for residential and commercial customers in California (Dillard pers. comm.; Energy Information Association 2009a, 2009b, and 2009c).

Buildings in the Project area result in indirect GHG emissions associated with electricity demand. The Project would receive electricity generated by NV Energy. Currently, NV Energy has third party verified emission factors for CO_2 only. According to NV Energy staff, the 2007 CO_2 emission factor for electricity delivered to customers was 1,443 pounds per megawatt-hour (Soyars pers. comm.).

State-specific emission factors for CH_4 and N_2O in 2007 were obtained from CCAR (California Climate Action Registry 2009). Since data regarding the change in the rate of emissions for CH_4 and N_2O with respect to CO_2 reduction efforts is unclear, CH_4 and N_2O emissions per kilowatt-hour of electricity generated were assumed to remain constant through 2021. It is likely that CH_4 and N_2O emission will decline as CO_2 emissions decline; however, because the direct relation is unclear, a worst-case scenario in which efficiencies of these emissions do not improve was assumed for the future-year (2021) condition.

Electricity transmission lines release SF_6 over time. Statewide SF_6 emissions in 2007 were used to identify an emission factor per megawatt-hour by dividing total SF_6 emissions by the total electricity generation in California (California Air Resources Board 2009i; California Energy Commission 2009). Once the per-unit emission factor of 0.00032 pounds of SF_6 per megawatt-hour was obtained, it was multiplied by the estimated electricity consumption at HMR to obtain total SF_6 emissions associated with electricity delivery to the Project. The emission factor was assumed to remain constant over time to represent a worst-case scenario for the future-year (2021) condition.

According to Beaudin Ganze Inc., total electricity consumption for the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, and 6 equates to ~~44,593,658~~43,374,000 kilowatt-hours per year. Statistics provided by JMA Ventures, LLC indicate that existing conditions (No Project [Alternative 2]) at HMR consume approximately 1,372,000 kilowatt-hours per year (Tirman pers. comm. (B)). These statistics include electricity consumption from residential and commercial land uses and snowmaking. Electricity consumption for Alternative 4 is based on average demand in California in 2007. According to NV Energy, the average annual monthly electricity usage per single family home is 755 kilowatt-hours. According to the EIA, average monthly electricity usage per commercial customer in California is 5,772 kilowatt-hours (Energy Information Association 2009a). Assuming 16 single family homes and one 15,000 square foot commercial/retail building will be constructed at HMR, total electricity consumption for Alternative 4 was assumed to be 214,224 kilowatt-hours per year.

Total GHG emissions resulting from electricity consumption ~~in 2021~~ are listed in Table 19-17. As discussed above, emission factors were assumed to remain constant between 2008 and 2021. The emissions presented in Table 19-21 therefore describe both the existing (2008) and future-year (2021) conditions.

Annual natural gas usage for the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, and 6 was obtained from Beaudin Ganze Inc. and was assumed to be 1,064,000 therms per year (Beaudin Ganze Inc. 2007). Annual natural gas usage for existing conditions (No Project [Alternative 2]) was provided by JMA Ventures, LLC and was assumed to be 11,000 therms (Tirman pers. comm. (B)). Natural gas usage for Alternative 4 was calculated using average consumption rates for residential and commercial customers in California (Energy Information Association 2009b and 2009c). According to the EIA, average annual natural usage per residential household and commercial customer was 485 therms and 5,777 therms, respectively (Energy Information Association 2009c). Assuming 16 single family homes and one 15,000 square foot commercial/retail building will be construed at HMR, total natural gas consumption for Alternative 4 would be 13,535 therms per year.

The Project area would receive natural gas from Southwest Gas, which currently has no third party verified emission factors. Consequently, natural gas emission factors for CO_2, CH_4, and N_2O were obtained CCAR and are listed in Table 19-~~18~~22. ~~It was assumed that these factors would remain constant over time to represent a worst-case scenario.~~

Annual GHG emissions were calculated by multiplying the emissions factors presented above by annual natural gas usage estimates. Table 19-~~19~~ 23 summarizes total annual GHG emissions from natural gas use. As discussed above, emission factors were assumed to remain constant between 2008 and 2021. The emissions presented in Table 19-23 therefore describe both the existing (2008) and future-year (2021) conditions.

Table 19-21

Total Emissions Associated with Annual ~~(2021)~~ Electricity Consumption under Existing (2008) and Future Year (2021) Conditions (metric tons)[1]

	Use (kilowatt-hour per year)[2~~1~~]	CO_2[3~~2~~]	CH_4[4~~3~~]	N_2O[5~~4~~]	SF_6[6~~5~~]	CO_2e
Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, & 6	~~44,594,000~~43,374,000	~~23,120~~22,487	~~0.611~~0.59	~~0.164~~0.16	0.006	~~23,338~~22,700
No Project (Alternative 2)[6]	1,372,000	711	0.019	0.005	0.000	718
Alternative 4[7]	214,224	111	0.003	0.001	0.000	118

Sources: Beaudin Ganze Inc. 2007 ; Tirman pers. comm. (B); Energy Information Administration 2009a; Soyars pers. comm.; California Climate Action Registry 2009; California Air Resources Board 2009i; California Energy Commission 2009; Dillard pers. comm.

Notes:

1 Emission factors and consumption assumed to remain constant between 2008 and 2021.

2~~1~~ Beaudin Ganze Inc. 2007; Tirman pers. comm. (B); Dillard pers. comm.; EIA 2009a

3~~2~~ Based on NV Energy 2007 emission factor of 1,443 pounds per megawatt-hour (Soyars pers. comm.).

4~~3~~ Based on CCAR 2007 emission factor of 0.0302 pounds per megawatt-hour (CCAR 2009).

5~~4~~ Based on CCAR 2007 emission factor of 0.0081 pounds per megawatt-hour (CCAR 2009).

6~~5~~ SF_6 emissions were calculated by dividing overall SF_6 emissions for the State of California in 2007 (0.99 MMT of CO_2) (California Air Resources Board 2009i, page 19) by total California electricity consumption in 2007 (281,200 million kilowatt-hours) (California Energy Commissions 2009) and multiplying the resulting emission factor of 0.00032 pounds per megawatt-hour by the estimated electricity consumption for HMR.

~~6 Emission factors and consumption assumed to remain constant between 2008 and 2021.~~

7 16 single-family homes and one 15,000 square foot commercial/retail building were assumed to operate with buildout.

Table 19-22

GHG Emission Factors for Residential and Commercial Natural Gas Combustion (metric tons)

GHG	Natural Gas Emissions Factor (kilograms per million British thermal unit)
CO_2	53.0600
CH_4	0.0050
N_2O	0.0001

Sources: California Climate Action Registry 2009 pg. 101 and 103; Energy Information Administration 2009.

Table 19-23

Total Emissions Associated with Annual ~~(2021)~~ Natural Gas Consumption under Existing (2008) and Future Year (2021) Conditions (metric tons)[1]

	Use (cubic feet per year)[2~~1~~]	CO_2	CH_4	N_2O	CO_2e
Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, and 6	103,501,946[3~~2~~]	5,651	0.532	0.011	5,666
No Project (Alternative 2)[3]	1,070,039[3~~2~~]	58	0.006	0.000	59
Alternative 4[4]	1,316,672	72	0.007	0.000	72

Sources: Beaudin Ganze Inc.; Tirman pers. comm. (B); EIA 2009a and 2009b; Energy Information Administration 2009; California Climate Action Registry 2009 pages 101 and 103.

Notes:

1 Emission factors and consumption assumed to remain constant between 2008 and 2021.

2~~1~~ Beaudin Ganze Inc.; Tirman pers. comm. (B); EIA 2009a and 2009

3~~2~~ Usage converted from therms assuming 1 therm = 100,000 British thermal units and 1,028 British thermal units = 1,000 cubic foot of natural gas.

~~3 Emission factors and consumption assumed to remain constant between 2008 and 2021.~~

4 16 single-family homes and one 15,000 square foot commercial/retail building were assumed to operate at full buildout.

Water Supply and Distribution

Energy is required to treat and deliver water. Domestic water for HMR is supplied by the Madden Creek Water Company (MCWC) and Tahoe City Public Utility District (TCPUD). According to JMA Ventures, LLC, current water usage is 4.8 million gallons per year (Tirman pers. comm. (B)). This statistic includes both domestic and snowmaking water usage, but was collected over the past two seasons when the HMR owned and operated well used for snowmaking was not functioning. During normal well operation, snowmaking uses approximately 17.5 million gallons per year (Homewood Mountain Resort Snowmaking Plan 2009). Estimated annual domestic water consumption for the Proposed Project (~~Alternative 1~~Alternative 1/1A) from residential, commercial, and irrigation uses was provided by Nichols Consulting Engineers and was assumed to be 62 acre feet, or 20.2 million gallons per year (Nichols Consulting Engineers 2010). Water consumption from snowmaking operations was obtained from Snowmakers Inc. (2009) and was estimated to be 70.5 million gallons per year. It was assumed that these figures would represent total water usage for the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, and 6 (Tirman pers. comm. (D)).

Water consumption for Alterative 4 was not provided. Information on the number and type of fixtures in each building, as well as the occupancy/employment rate at the commercial facility would be necessary to develop an estimate of water consumption for Alternative 4. This information is currently unavailable. Consequently, an estimate of domestic water consumption for Alternative 4 was based on average values obtained from the United States Department of Agriculture (USDA) and the United States Geological Survey (USGS) (USDA 2009; USGS 2009). Specifically, the following assumptions were made:

- **Residential Water Consumption**: According to the USDA, an average California household uses one-half to one acre-foot (0.16 – 0.33 million gallons) of water per year (USDA 2009). It was therefore assumed that each single family home would use 0.33 million gallons of water for a total demand of 5.2 million gallons per year.

- **Commercial Water Consumption**: According to the USGS, an individual uses between 80-100 gallons of water per day (USGS 2009). Assuming employees spend one-third of their day at work, 33 gallons of water per individual would be consumed at the commercial facility. Based on the daily trip rate for the commercial lot, it is estimated that 30 individuals will be employed at the facility. If employees work 250 days per year, domestic water consumption would be 0.25 million gallons per year.

Total water consumption for Alternative 4 was therefore estimated to be 5.5 million gallons per year.

The estimated water-energy proxy for water supplied by the TCPUD service district is 2,320 kilowatt-hours per million gallons (Laliotis pers. comm.). Based on Snowmakers Inc. (2009), it was assumed that an energy load of 3,145 horsepower and a pumping capacity of 3,400 gallons per minute would be required to generate adequate snow at HMR. Assuming a 0.746 kilowatt per horsepower rating, the estimated water-energy proxy for the snowmaking is 11,610 kilowatt-hours per million gallons~~-~~.

Indirect GHG emissions associated with water supply were calculated by multiplying the expected domestic and snowmaking water demand by the estimated water-energy proxies. These values were then multiplied by the same emissions factors for electricity generation described in the "Electricity and Natural Gas Use" section above. It was assumed that the HMR owned and operated wells would supply water for snowmaking and that domestic water would be supplied by TCPUD

Table 19-~~20~~ 24 details expected water demand, associated energy use, and indirect GHG emissions resulting from the supply of water to HMR. Water demand, energy use, and electricity emission factors~~-~~was assumed to remain constant between 2008 and 2021. ~~through Project buildout.~~. The emissions presented in Table 19-24 therefore describe both the existing (2008) and future-year (2021) conditions.

Wastewater Treatment

Wastewater from HMR is treated by the Tahoe-Truckee Sanitation Agency (T-TSA). Wastewater can produce CH_4 and N_2O when treated anaerobically. CO_2 emissions from wastewater are considered biogenic (i.e. produced by life processes) in origin and therefore are not included in estimates of anthropogenic emissions (Intergovernmental Panel on Climate Change 2006). Wastewater will break down under anaerobic conditions in the T-TSA systems and during the wastewater treatment process, which will produce CH_4 as a byproduct. Tertiary treatment will remove some nitrogen from the reclaimed water and dried solids.

Table 19-24

Annual- Water Supply Intensity and Resulting GHG Emissions under Existing (2008) and Future Year (2021) Conditions (metric tons)[1]

	Use (million gallons per year)		kilowatt-hours per year	CO_2	CH_4	N_2O	SF_6	CO_2e
Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, and 6	Domestic	20.2	46,860	24.300	0.0006	0.0002	0.0000	24.530
	Snowmaking	70.4	818,543	424	0.0112	0.0030	0.0001	428.386
No Project (Alternative 2)	Domestic	4.8[2]	11,136	5.774	0.0002	0.0000	0.0000	5.828
	Snowmaking	17.5	203,184	105	0.0028	0.0007	0.0000	106.337
Alternative 4 ~~(2)~~[3]	Domestic	5.46	12,667	6.567	0.0002	0.0000	0.0000	6.629

Source: Nichols Consulting Engineers 2009; Snowmakers Inc. 2009, Tirman pers. comm. (B); USDA 2009; USGS 2009; Laliotis pers. comm.

Notes:
1 Water demand, energy use, and emission factors assumed to remain constant between 2008 and 2021.
2~~1~~ This statistic includes a minor amount of water used for snowmaking. Since the percent breakdown of domestic to snowmaking water usage could not be obtained, it was assumed the entire 4.8 million gallons was used for domestic purposes as a worst case scenario.
3~~2~~ No snowmaking would occur under Alternative 4.

Emissions from wastewater treatment were calculated using Statewide ARB emission rates for CH_4 and N_2O. The ARB estimates 2006 yearly emissions resulting from domestic wastewater treatment in the State of California were 522 g of CH_4 and 85.6 g of N_2O per person (California Air Resources Board 2009j and 2009k). According to Beaudin Ganze, sanitary sewer discharge for Alterative 1 is 70,400 gallons per day (Beaudin Ganze 2007). This estimate was assumed to represent sewer discharge from Alternatives 1A, 3, 5, and 6 (Tirman pers. comm. (D)). Sewer discharge for No Project (Alternative 2) was assumed to equal domestic water intake, which was estimated at 24% of the total water usage provided by JMA Ventures, LLC (above) (Tirman pers. comm. (B)). Sewer discharge for Alternative 4 was assumed to equal domestic water usage, or 15,280 gallons per day. The one to one ratio of domestic water to sewer discharge is based on the assumption that sewer flow will be near the daily building cold water usage (Beaudin Ganze 2007).

Use of the ARB emission rates for CH_4 and N_2O, which are recorded in grams per person, requires a detailed inventory of the population at HMR. This information is currently unavailable. Consequently, an estimate of the permanent and visitor population at HMR was calculated using the best available information.

From Chapter 7 – Population, Employment, and Housing, implementation of the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3 will result in 471 permanent residents. Alternatives 4 would accommodate a population increase of 42 persons. Alternatives 5 and 6 will provide housing for 627 and 413 residents, respectively. These statistics assume 100% occupancy and represent a worst-case scenario.

Based on the most recent EPA GHG inventory, it was assumed that the average individual produces 100 gallons of wastewater per day (Environmental Protection Agency 2009e). Wastewater production from permanent residents was therefore calculated by multiplying the expected population by 100 gallons. The remaining wastewater was assumed to be produced by employees and visitors. It was assumed that these individuals would spend one-third to one-half of their day at HMR, contributing roughly 50 gallons of wastewater per day. Total HMR population was therefore calculated using the following equations:

Visitor/ Employee Wastewater = (Total wastewater) - ((Full-time residents) X (100 gallons/day))

Visitor/Employee Population = (Visitor/Employee wastewater) / (50 gallons per day)

Total HMR Population = (Visitor/Employee population) + (Full-time residents)

Where:

Total wastewater = Statistics provided by Beaudin Ganze, JMA Ventures LLC, and USGS/USDA

Full-time residents = Estimates in Chapter 7 – Population, Employment, and Housing.

Emissions of CH_4 and N_2O from sanitary sewer discharge at HMR were calculated by multiplying the total population by the ARB emission factors for both CH_4 and N_2O. It was assumed the population would remain constant through Project buildout. The population estimates calculated using the above methodology assume each individual will produce the same amount of wastewater. In addition, it does not take into account the seasonal population flux, which would result in higher population estimates during the winter season and lower population estimates during the summer season. However, the calculations represent a good faith effort at calculating the average population at HMR based on Project-specific sanitary sewer information and average wastewater production values. Moreover, because annual wastewater emissions from the part-time population (e.g. visitors and employees) presented in Table 19-~~21~~ 25 were multiplied by a factor of 365, this analysis likely overestimates total emissions from sanitary sewer discharge.

The total annual GHG emissions under existing (2008) and future year (2021) conditions from Project-generated wastewater ~~associated with the project~~ are presented in Table 19-~~21~~25.

Summary of Project Level Emissions

Table 19-~~22~~ 26 presents construction emissions. Because construction emissions are a one-time event, these emissions are considered short-term in comparison to ongoing GHG emissions associated with Project operations.

Tabled 19-~~23~~ 27 and 19-28 lists ~~existing and with Project~~ annual GHG emissions by source under existing (2008) and future year (2021) conditions, respectively. Emission factors associated with transportation and energy usage are likely to decrease over time. Therefore, emissions calculations for Project operation under the future year (2021) likely overestimate ~~future~~ annual emissions.

Implementation of the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, and 6 would result in a net increase in local GHG emissions ~~above existing~~compared to the No Project (Alternative 2) ~~conditions~~. Alternative 4 would result in a net reduction in GHGs from the Project area. GHG emissions tend to accumulate in the atmosphere because of their relatively long lifespan. As a result, their impact on the atmosphere is mostly independent of the point of emission. Therefore, GHG emissions are more appropriately evaluated on a regional, State, or even national scale than on an individual project level. Further, it is unlikely that the GHGs emitted as part of the Project would have an individually discernable effect on global climate change.

Mitigation: No mitigation is required.

Table 19-25

Population Estimates, Sanitary Sewer Discharge, and Resulting GHG Emissions under Existing (2008) and Future Year (2021) Conditions (metric tons)[1]

Scenario	Full-time Residents	Visitors and Employees[2]~~[1]~~	Sanitary Sewer (gallons per year)[3]~~[2]~~	~~CO_2~~~~[3]~~ CO_2[4]	CH_4	N_2O	CO_2e
Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3	471	466	25,696,000	0.00	179	29	12,825
No Project (Alternative 2)	0	63	1,152,000	0.00	12	0	253
Alternative 4	42	30[4]	5,577,200	0.00	14	2	985
Alternative 5	627	154	25,696,000	0.00	149	24	10,689
Alternative 6	413	582	25,696,000	0.00	190	31	13,618

Source: California Air Resources Board 2009j and 2009k; Beaudin Ganze 2007; Tirman pers. comm. (B); Environmental Protection Agency 2009e.

Notes:

[1] Population, sewer discharge, and emission factors assumed to remain constant between 2008 and 2021.

[2]~~[1]~~ Chapter 7 describes employment expected at HMR with the Project. The difference between this number and the figure presented in Table 19-~~21~~ 25 represents the estimated number of guests contributing to the sanitary sewer discharge. ~~gallons per day by 365.~~

[2]~~[3]~~ Based on calculation~~e~~s completed for commercial water usage (see "Water Supply and Distribution" above). ~~CO_2 emissions considered biogenic and were not calculated.~~

[3]~~[4]~~ CO_2 emissions were considered biogenic and were not calculated.~~Based on calculates completed for commercial water usage (see "Water Supply and Distribution" above).~~

Table 19-26

Total GHG Emissions Associated with Construction of HMR (metric tons)

Scenario	CO_2e
Proposed Project (~~Alternative 1~~Alternative 1)~~/1A) and Alternative 3~~	3,014~~2,684~~
Alternative 1A	2,747
No Project (Alternative 2)	0~~0~~
Alternative 3	3,658
Alternative 4	119~~119~~
Alternative 5	3,408~~2,734~~
Alternative 6	3,155~~2,697~~

Source: Section 19.4.1 – Construction GHG Emission.

Table 19-27

Annual- Operational GHG Emissions Associated with HMR under Existing (2008) Conditions (metric tons)

Scenario	Source	CO_2e
Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3	Transportation	1,910
	Area Source	18
	Refrigeration/AC	862
	Electricity Usage	22,700
	Natural Gas Combustion	5,666
	Water Supply	453
	Wastewater Treatment	12,825
	Total Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3	**44,433**
No Project (Alternative 2)	Transportation	1,018
	Area Source	26
	Refrigeration/AC	33
	Electricity Usage	718
	Natural Gas Combustion	59
	Water Supply	112
	Wastewater Treatment	253
	Total No Project (Alternative 2)	**2,220**
Alternative 4	Transportation	411
	Area Source	1
	Refrigeration/AC	9
	Electricity Usage	118
	Natural Gas Combustion	72
	Water Supply	7
	Wastewater Treatment	985
	Total Alternative 4	**1,602**
Alternative 5	Transportation[1]	1,731
	Area Source	18
	Refrigeration/AC	827
	Electricity Usage	22,700
	Natural Gas Combustion	5,666
	Water Supply	453
	Wastewater Treatment	10,689
	Total Alternative 5	**42,084**
Alternative 6	Transportation	1,685
	Area Source	18
	Refrigeration/AC	826
	Electricity Usage	22,700
	Natural Gas Combustion	5,666
	Water Supply	453

Scenario	Source	CO_2e
	Wastewater Treatment	13,618
	Total Alternative 6	**44,966**

Source: Section 19.4.1 – Construction GHG Emissions, Section 19.4.2, Operational GHG Emissions.

Notes
1. As discussed in Chapter 12, the summer VMT estimates for Alternative 5 did not include trips associated with the 12 workforce housing units. The emissions presented above will therefore be slightly higher with the inclusion of these units.

Table 19-28

Annual -Operational GHG Emissions Associated with HMR under Future Year (2021) Conditions (metric tons)

Scenario	Source	CO_2e
Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3	Transportation	1,906~~3~~
	Area Source	18
	Refrigeration/AC	862
	Electricity Usage	~~23,338~~22,700
	Natural Gas Combustion	5,666
	Water Supply	453
	Wastewater Treatment	12,825
	Total Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternative 3	**4~~5,064~~4,4294~~5,064~~**
No Project (Alternative 2)	Transportation	1,010
	Area Source	26
	Refrigeration/AC	33
	Electricity Usage	718
	Natural Gas Combustion	59
	Water Supply	112
	Wastewater Treatment	253
	Total No Project (Alternative 2)	**2,212**
Alternative 4	Transportation	411
	Area Source	1
	Refrigeration/AC	9
	Electricity Usage	118
	Natural Gas Combustion	72
	Water Supply	7
	Wastewater Treatment	985
	Total Alternative 4	**1,602**
Alternative 5	Transportation[1]	1,~~724~~727~~1,724~~
	Area Source	18
	Refrigeration/AC	827
	Electricity Usage	22,700~~23,338~~
	Natural Gas Combustion	5,666
	Water Supply	453
	Wastewater Treatment	10,689
	Total Alternative 5	**~~42,715~~42,079~~42,715~~**
Alternative 6	Transportation	1,~~678~~681~~1,678~~
	Area Source	18
	Refrigeration/AC	826
	Electricity Usage	22,700~~23,338~~
	Natural Gas Combustion	5,666

Scenario	Source	CO_2e
	Water Supply	453
	Wastewater Treatment	13,618
	Total Alternative 6	**~~45,597~~44,961~~45,597~~**

Source: Section 19.4.1 – Construction GHG Emissions, Section 19.4.2, Operational GHG Emissions.

Notes

1. As discussed in Chapter 12, the summer VMT estimates for Alternative 5 did not include trips associated with the 12 workforce housing units. The emissions presented above will therefore be slightly higher with the inclusion of these units.

19.2 CUMULATIVE IMPACTS AND MITIGATION MEASURES

In accordance with the 2010 CEQA Guidelines, this section discusses Project GHG emissions within a cumulative context. Reduction strategies already committed to by the Project Applicant, as well as additional mitigation measures to further reduce GHG emissions are identified.

Impact: CC-C1. Will the Project Generate GHG Emissions, Either Directly or Indirectly, that may Have a Significant Impact on the Environment?

Analysis: *No Impact; No Project (Alternative 2)*

No Project (Alternative 2) will not include any changes to the existing HMR Project area or structures. Therefore, there will be no new GHG emissions. There would therefore be no impact. No further analysis is required.

Mitigation: No mitigation is required.

Analysis: *Less than Significant Impact; Alternative 4*

Implementation of Alternative 4 is expected to reduce GHG emissions ~~by 618 metric tons per year~~ compared to ~~existing~~ the No Project ~~conditions~~ (Alternative 2) under both existing (2008) and future-year (2021) conditions (Tables 19-27~~3~~ and 19-28). Consequently, this impact is considered a less than significant cumulative contribution of GHGs and to climate change.

Mitigation: No mitigation is required.

Analysis: *Significant Impact; Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, and 6*

Unlike criteria pollutant impacts, which are local and regional in nature, climate change impacts occur at a global level. The relatively long lifespan and persistence of GHGs (Table 19-1) require that climate change be considered a cumulative and global impact. It is unlikely that that any increase in global temperature or sea level could be attributed to the emissions resulting from a single project. Rather, it is more appropriate to conclude Project-related GHG emissions will combine with emissions across California, the U.S., and the globe to cumulatively contribute to global climate change.

To put the Project in perspective, total estimated GHG emissions under both existing (2008) and future (2021) conditions were compared to the most recent global, national, and State GHG inventories. Construction emissions, which will be produced during

Project development but not during Project operation, were amortized assuming a 40-year Project lifetime and included in the emissions totals. Based on the estimates presented in Table 19-~~24~~29, the Project and alternatives would have a miniscule impact on State, federal, and international emissions of GHGs.

While GHG emissions from the Project may be negligible relative to total State, national, and global emissions, scientific consensus concludes that given the seriousness of climate change, small contributions of GHGs may be cumulatively considerable. When compared to existing emissions, the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, and 6 would result in net increases of GHGs. _Based on consultation with the PCAPCD, Placer County, and the TRPA, the magnitude of these emissions would result in the Project having a significant cumulative impact on the environment (Clark, Chang, and Landry pers. comm.).

~~For the purposes of this cumulative impact analysis, it is assumed that GHG emission estimates for Alternative 1, Alternative 1A (both considered the Proposed Project), and Alternative 3 are quantitatively similar and would result in similar impacts. Therefore, a single GHG emission estimate was calculated for Alternative 1, Alternative 1A (both considered the Proposed Project), and Alternative 3. Qualitatively, with five more multi-family housing units, GHG emissions related to the construction and operation of Alternative 1 and Alternative 3 and expected to be slightly greater than Alternative 1A, but the difference is expected to be minor and the impact conclusions and proposed mitigation measures would be the same. Alternative 1A is not expected to result in impacts other than those described for Alternative 1 or Alternative 3.~~

Table 19-29

Comparison of Annual HMR GHG Emissions under Existing (2008) Conditions to~~in~~ California, U.S., and Global Emissions

Emissions Type	CO_2e (metric tons)		
2006 ARB Statewide GHG Emissions	483,900,000	–	–
2007 EPA National GHG Emissions	7,510,100,000	–	–
2004 IPCC Global GHG Emissions	49,000,000,000	–	–
2008 Scenario	**HMR % of ARB Statewide**	**HMR % of EPA National**	**HMR % of IPCC Global**
~~Existing Annual HMR GHG Emissions~~	~~0.000407%~~	~~0.000026%~~	~~0.000004%~~
Proposed Project (Alternative 1) Annual (2008) HMR GHG Emissions[1]	0.009198%	0.000593%	0.000091%
Alternative 1A Annual (2008) HMR GHG Emissions[1]	0.009197%	0.000593%	0.000091%
No Project (Alternative 2) Annual (2008) HMR GHG Emissions	0.000459%	0.000030%	0.000005%
Alternative 3 Annual (2008) HMR GHG Emissions[1]	0.009201%	0.000593%	0.000091%
Alternative 4 Annual (2008) HMR GHG Emissions[1]	0.000332%	0.000021%	0.000003%
Alternative 5 Annual (2008) HMR GHG Emissions[1]	0.008714%	0.000562%	0.000086%
Alternative 6 Annual (2008) HMR GHG Emissions[1]	0.009309%	0.000600%	0.000092%
2021 Scenario	**HMR % of ARB Statewide**	**HMR % of EPA National**	**HMR % of IPCC Global**
Proposed Project (Alternative 1) Annual (2021) HMR GHG Emissions[1]	0.009197%	0.000593%	0.000091%
Alternative 1A Annual (2021) HMR GHG Emissions[1]	0.009196%	0.000593%	0.000091%
No Project (Alternative 2) Annual (2021) HMR GHG Emissions	0.000457%	0.000029%	0.000005%
Alternative 3 Annual (2021) HMR GHG Emissions[1]	0.009200%	0.000593%	0.000091%
Alternative 4 Annual (2021) HMR GHG Emissions[1]	0.000332%	0.000021%	0.000003%
Alternative 5 Annual (2021) HMR GHG Emissions[1]	0.008713%	0.000561%	0.000086%
Alternative 6 Annual (2021) HMR GHG Emissions[1]	0.009308%	0.000600%	0.000092%

Sources: IPCC 2006c; EPA 2009a; ARB 2009a.

Notes:
[1] Construction emissions have been amortized over a 40-year period.

Project Commitments

The Project Applicant has committed to numerous GHG reduction strategies through participation in the LEED for Neighborhood Development Pilot Program (LEED-ND). Unlike traditional LEED programs, LEED-ND evaluates not just individual buildings, but the overall project design. The LEED-ND rating system is divided into three primary categories: Smart Location, Neighborhood Pattern, and Green Infrastructure. These categories have prerequisites that are required for all projects, as well as additional credits that reward performance. The final project score is reflected in the certification level, which include "certified" (40 points), "silver" (50 points), "gold" (60 points), and "platinum" (80 points).

The North Base area will be designed under the Pilot Program and the South Base area will be constructed using the LEED criteria as a template. In addition, HMR has developed an Alternative Transportation Program (Transportation Program) to reduce reliance on the automobile. The North Base has been accepted into the program with a pre-certification estimate of 68 points ("gold level"). Table 19-~~25~~ 30 identifies the GHG reduction strategies committed to by the Project Applicant through LEED certification and the Transportation Program.

There is limited research on the CO_2 reduction potentials of individual LEED strategies. Instead, several documents have quantified the net energy, water, and waste savings resulting from LEED certification. According to the U.S. Green Building Council (USGBC), green buildings can reduce energy use by 24%-50%, water use by 40%, and solid waste by 70% (USGBC 2009). With regards to total CO_2 emissions, recent case studies on certified green buildings revealed an average reduction of 33%-39% (GSA Public Buildings Services 2008; Kats 2003).

The Bay Area Air Quality Management District (BAAQMD), Sacramento Metropolitan Air Quality Management District (SMAQMD), and San Joaquin Valley Air Pollution Control District have published various guidance documents with pre-quantified reduction potentials for mitigation measures used in the Bay Area, Sacramento Metropolitan Area, and San Joaquin Valley (EDAW 2009; SMAQMD 2008; SJVAPCD 2009). When appropriate, Table 19-~~25~~ 30 lists these reductions to provide an approximation of the potential CO_2 reductions that may be achieved by the identified HMR LEED-ND strategies. Note that the reduction potentials have not been scaled to Project-specific emissions or resource sectors (e.g. natural gas, electricity).[6]

[6] "Reduction potentials should be scaled proportionally to their sector of project-generated emissions. For example, if a measure would result in a 50 percent reduction in residential natural gas consumption, but only 20 percent of a project's emissions are associated with natural gas consumption, and only 10 percent of a project's emissions are from residential land uses, then the scaled reduction would equal one percent (50% * 20% * 10% = 1%) (EDAW 2009)."

Table 19-30

Greenhouse Gas Reduction Strategies and Associated Reduction Potentials

GHG Reduction Strategy	Potential Reduction[1]	Comments and Notes
Smart Location and Linkage[2]		
Preferred Location		
Reduced Automobile Dependence[3]	2%	Credit awarded based on LEED checklist application that 100% of dwelling units will be within 0.25 mile of transit stops. Note that additional reductions would be achieved from other measures included in this strategy (EDAW 2009, USGBC 2007).
Bicycle Network	1%-5%	The Center for Clean Air Policy (CCAP) guidebook attributes a 1% to 5% reduction associated with the use of bicycles, which reflects the assumption that their use is typically for shorter trips (SMAQMD 2008).
Housing and Jobs Proximity		
Steep Slope Protection		
Site Design for Habitat or Wetlands Conservation		
Restoration of Habitat or Wetlands		
Conservation Management of Habitat/Wetlands		
Neighborhood Pattern and Design[2]		
Open Community		
Compact Development	0.20%	Credit awarded based on LEED Rating System that 1 point achieves a Floor to Area Ratio (FAR) of 0.75-1. Reduction based on SMAQMD FAR with planned bus service (USGBC 2007, SJVAPCD 2009).
Diversity of Uses		Project would result in 50% of the dwelling units being located within 1/2 mile of ten mixed-uses (USGBC 2007).
Diversity of Housing Types		
Affordable Rental Housing	0-4%	Reduction applies to the mobile source sector (EDAW 2009).
Reduced Parking Footprint[4]	0-50%	Reduction applies to the mobile source sector (EDAW 2009).
Walkable Streets	0.25%-0.50%	Based on SJVAPCD credit for projects orientated toward bike and pedestrian facilities. Note that additional reductions would be achieved by other measures included in this strategy (SJVAPCD 2009).
Transit Facilities	0-15%	Reductions apply to mobile source sector (EDAW 2009).

GHG Reduction Strategy	Potential Reduction[1]	Comments and Notes
Transportation Demand Management[5]	25% of transit service reduction	Reduction credit given for free transit passes and only applies to resident/employee trips. Reductions apply to mobile source sector. Additional reductions would be achieved by the transit service provided in this strategy (EDAW 2009).
Access to Surrounding Vicinity		
Access to Public Spaces	1%	Based on SMAQMD credit for projects located within 0.25 mile of civic uses. According to the LEED Rating System, the Project will be designed so that parks and green plazas will be within 1/6 mile walk distance to 90% of planned dwelling units (SJVAPCD 2009, USGBC 2007).
Access to Active Public Spaces		Reduction included under "Access to Public Spaces."
Universal Accessibility		
Community Outreach and Involvement		
Local Food Production		
Green Construction & Technology[2]		
Construction Activity Pollution Prevention		
LEED Certified Green Buildings		
Energy Efficient in Buildings		Based on LEED Rating System, the Project will demonstrate a 20% reduction in building performance compared to baseline or comply with ENERGY STAR ratings (USGBC 2007).
Reduced Water Use		Based on LEED Rating System, this strategy may achieve an aggregate water reduction of 20% when compared to building baseline conditions (USGBC 2007).
Minimize Site Disturbance through Site Design		
Minimize Site Disturbance during Construction		
Stormwater Management		Based on the LEED Rating System and application, the Project will implement a plan that infiltrates, reuse, or evapotranspirates at least 0.75 inches of rain (USGBC 2007).
Heat Island Reduction		
On-Site Energy Generation		Based on LEED Rating System, the Project will develop on-site energy generation system(s) with peak electrical generating capacity of at least 5% of the Project's specified electrical service load (USGBC 2007).
Infrastructure Energy Efficiency		Based on LEED Rating System, the Project will achieve a 15% annual energy reduction beyond an estimated baseline energy use for infrastructure (USGBC 2007).
Recycled Content for Infrastructure		

GHG Reduction Strategy	Potential Reduction[1]	Comments and Notes
Construction Waste Management		Based on LEED Rating System, 50% of non-hazardous construction and demolition debris will be recycled and/or salvaged (USGBC 2007).
Comprehensive Waste Management		
Light Pollution Reduction		
Innovation and Design Process[2]		
LEED Accredited Professional		
Transportation Management Program[6]		
Extension of West Shore Bike Trail		Reduction of 1%-5% attributed to bicycle strategies. See "Bicycle Network."
Bicycle Share Service		Reduction of 1%-5% attributed to bicycle strategies. See "Bicycle Network."
Intercept Existing Vehicle Trips		
Transportation Information Strategies		
Regional Transportation Solutions		
Summer Boat Parking		

Source: LEED Application; Homewood Transportation Newsletter; SMAQMD 2008; SJVAPCD 2009; EDAW 2009; USGBC 2007.

Notes
1 Potential GHG reductions represent an approximation. They have not been scaled to the individual Project or sectors.
2 Strategies obtained from the LEED for Neighborhood Development Pilot Project Checklist, which was submitted by the ~~project applicant~~Project Applicant during the pre-review submittal phase.
3 Overlaps with several strategies outlined in the Transportation Program (e.g. electric/hybrid car rental and transit services).
4 Overlaps with the Day Skier Parking Control strategy outlined in the Transportation Program.
5 Overlaps with several of the strategies outlined in the Transportation Program. These include an employee shuttle bus, bus fares, scheduled shuttle service, North-South base area shuttle series, skier intercept shuttle, West Shore dial-a-ride, and water taxi service.
6 Strategies obtained from the HMR Alternative Transportation Newsletter provided by LLC Ventures. Those measures that overlap with LEED strategies identified above have not been included in this list.

Based on the pre-applicant checklist completed for HMR, the ~~project~~ Project is expected to achieve gold certification. Implementation of Mitigation Measure CC-1 is required to document and verify ~~project~~ Project certification.

Mitigation: **CC-1: Document and Verify Implementation of the Project GHG Reduction Commitments**

The ~~project~~ Project ~~applicant~~ Applicant shall document and verify the ~~project~~ Project commitments outlined in Table 19-~~25~~ 30 have been incorporated into the final ~~project~~ Project design. Copies of the pre-certification plan (Stage 2 in the LEED-ND process) shall be provided to PCAPCD and TRPA. Once the ~~project~~ Project is complete, the final LEED-ND certification that verifies the north base has achieved all of the prerequisites and credits required for Gold certification shall be submitted to the air districts.

CC-2: Implement Project Design Features to Further Reduce Project Contribution to Climate Change

A recent report by the California Attorney General's (AG) office, *The California Environmental Quality Act: Addressing Global Warming at the Local Agency Level,* identifies various example measures to reduce GHG emissions at the project level (State of California Department of Justice 2008). The following Project design features were compiled from the California AG's Office report and are intended to provide additional strategies that could be incorporated into HMR Master Plan, especially at the South Base, to further reduce GHG emissions. Note that majority of the AG's strategies have been removed from the list below as they overlapped with actions already committed to by the Project Applicant (Table 19-~~25~~30), or are inapplicable to the Project because they address emissions from different types of projects.

The final ~~project~~ Project design shall incorporate the following applicable AG measures. A standard note indicating these requirements will be included on building plans approved in association with this ~~project~~ Project shall be included on building permits.

Energy Efficiency

- Use solar heating, automatic covers, and efficient pumps and motors for pools and spas.

Renewable Energy

- Install solar or wind power systems and solar hot water heaters. Educate consumers about existing incentives.
- Install solar panels on carports and over parking areas.

Water Conservation and Efficiency

- Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls.
- Restrict watering methods (e.g., prohibit systems that apply water to non-vegetated surfaces) and control runoff.
- Restrict the use of water for cleaning outdoor surfaces and vehicles.
- Provide education about water conservation and available programs and incentives.

Solid Waste Measures

- Provide education and publicity about reducing waste and available recycling services.

Transportation and Motor Vehicles

- Limit idling time for commercial vehicles, including delivery and construction vehicles.
- Use low or zero-emission vehicles, including construction vehicles.
- Increase the cost of driving and parking private vehicles by, e.g., imposing tolls and parking fees.
- Institute a low-carbon fuel vehicle incentive program.

- Provide information on options for individuals and businesses to reduce transportation-related emissions. Provide education and information about public transportation.

After Mitigation: *Significant and Unavoidable Impact; Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3 5, and 6*

While the above measures will not eliminate Project GHG emissions, their inclusion will result in lower GHG emissions levels than had they not been incorporated. For example, green buildings have the potential to reduce CO_2 emissions associated with building operations by 33%-39% (GSA Public Buildings Services 2008; Kats 2003). In addition future State actions taken pursuant to AB 32 including requirements for lower carbon-content in motor vehicle fuels, improved vehicle mileage standards (provided California is not barred due to federal action), and an increased share of renewable energy in electricity generation will serve, in time, to further reduce GHG emissions.

The majority of development at HMR will include transferred tourist accommodation units (TAUs) and residential accommodation units (RAUs). Consequently, GHG emissions generated by these structures are not new to the Lake Tahoe Basin and would be emitted regardless of the Project. The transfer of existing TAUs and RAUs to the Project site may even reduce basin-wide GHG emissions, as the existing units are older and less efficient than those being constructed. While some new TAUs and RAUs will be required as part of the Project, they will be obtained from TRPA bonus inventory, which is analyzed in the TRPA Regional Plan. Consequently, new HMR-generated GHG emissions have been accounted for in previous planning documents. Please see Chapter 7 – Population, Employment, and Housing for more information on TAUs/RAUs. The mitigation measures and reduction strategies identified above will reduce Project-related GHG emissions, and the Project is being developed through existing and bonus TAUs and RAUs. However, it is unknown the extent to which climate change will be affected by GHG emissions from HMR. The possibility exists that the Project will contribute to global GHG emissions and global climate change. Therefore, the Project's cumulative impact to climate change after mitigation is considered significant and unavoidable.

Impact: CC-C2. Will the Project Conflict with any Applicable Plan, Policy or Regulation of an Agency Adopted for the Purpose of Reducing the Emissions of GHGs?

Analysis: *No Impact; No Project (Alternative 2)*

No Project (Alternative 2) will not include any changes to the existing HMR Project area or structures. Therefore, there will be no additional GHG emitted as result of No Project (Alternative 2). It will therefore not conflict with any plans to reduction GHG emissions. There would be no impact. No further analysis is required.

Mitigation: No mitigation is required.

Analysis: *Less than Significant Impact; Alternative 4*

Implementation of Alternative 4 is expected to reduce GHG emissions ~~by 617 metric tons per year,~~ relative to ~~existing conditions~~ the no Project (Alternative 2) under both existing (2008) and future year (2021) conditions (Tables 19-~~22~~27 and 19-28~~2~~). Consequently, Alternative 4 will compliment and assist plans in reducing regional GHG emissions. This impact is considered less than significant.

Mitigation: No mitigation is required.

Analysis: *Significant Impact; Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, and 6*

The State has adopted several polices and regulations for reducing GHG emissions (as discussed in Section 19.2). The most stringent of these is AB 32, which is designated to reduce Statewide GHG emissions to 1990 levels by 2020. The TMPO has outlined a serious of goals and polices geared towards reducing VMT and GHG emission from Transportation.

As shown in Tables 19-~~23~~27 and 19-28, the Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, and 6 would result in substantial net increases of GHG and vehicle trips in comparison to ~~existing~~ the No Project (Alternative 2)~~conditions~~ under both existing (2008) and future year (2021) conditions. Thus, Project-generated GHG emissions may conflict with the State goals listed in AB 32 and polices outlines in the 2008 RTP. This impact is considered significant.

Mitigation: **CC-1: Document and Verify Implementation of the Project GHG Reduction Commitments**

CC-2: Implement Project Design Features to Further Reduce Project Contribution to Climate Change

After Mitigation: *Significant and Unavoidable Impact; Proposed Project (~~Alternative 1~~Alternative 1/1A) and Alternatives 3, 5, and 6*

Mitigation Measures CC-1 and CC-2 will result in lower GHG emissions levels than had it not been incorporated, but it is unlikely to achieve reductions consistent with the requirements of AB 32. The possibility exists that the Project will contribute to global GHG emissions and therefore conflict with existing and future actions to reduce GHG emissions. Thus, this impact is considered significant and unavoidable.

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