Appendix E

Air Quality and Climate Change Information for Analysis

Appendix E
Criteria Pollutant and Greenhouse Gas Emissions Modeling Methodology and Assumptions

This appendix discusses the approach and methodology used to assess construction and operational emissions associated with the Pebble Beach Company Del Monte Forest Plan.

Construction

Construction of the proposed project would result in the temporary generation of emissions of ROG, NO_X, CO, PM10, PM2.5, and CO_2 that would result in short-term impacts on ambient air quality in the area. Emissions would originate from mobile and stationary construction equipment exhaust, employee vehicle exhaust, dust from clearing the land, exposed soil eroded by wind, and ROG from architectural coatings and asphalt paving. Construction-related emissions would vary substantially depending on the level of activity, length of the construction period, specific construction operations, types of equipment, number of personnel, wind and precipitation conditions, and soil moisture content.

The CalEEMod (version 2011.1.1) model was used to estimate emissions associated with construction of the proposed project. To estimate construction emissions, CalEEMod analyzes the type of construction equipment used and the duration of the construction period associated with construction of each of the proposed project land uses. Construction activities were separated into the following four phases: grading/demolition, building construction, paving, and architectural coating (i.e., paint). Table E-1 summarizes construction activity data (i.e., construction phasing and scheduling) for the project elements.

A detailed inventory of equipment that would be used to construct the proposed project elements was not provided by the project applicant. Consequently, emission calculations for construction activities were based on default equipment and activity data calculated by CalEEMod from on the construction phasing and a construction schedule provided by WWD Engineering (Lorentz pers. comm.). Table E-2 summarizes default construction equipment and activity data based on CalEEMod default values for the land use types and sizes associated with the project, while Table E-3 presents soil hauling and grading assumptions by land use. Daily worker commute vehicle miles traveled (VMT) and vendor trips for were estimated using default CalEEMod values.

Construction emissions associated with intersection improvements were estimated using the Sacramento Metropolitan Air Quality Management District's Road Construction Emissions Model (version 6.3.2). The road construction model is a public-domain spreadsheet model formatted as a series of individual worksheets. The model enables users to estimate emissions using a minimum amount of project-specific information. The model estimates emissions for load hauling (on-road heavy-duty vehicle trips), worker commute trips, construction site fugitive dust (PM10 and PM2.5), and off-road construction vehicles. Emissions associated with dust from material movement, on-road trips, on-road fugitive dust, and architectural coatings are based on CalEEMod default values and data presented in Table E-3 and E-5.

This analysis is based on anticipated construction equipment calculated by the Road Construction Emissions Model, which estimates construction equipment based on project size, duration of construction activities, and level of daily construction activities. Although exhaust emissions are estimated for each activity, fugitive dust estimates are currently limited to major dust-generating activities, which include grubbing/land clearing and grading/excavation.

Table E-4 outlines the modeling inputs used to quantify construction emissions.

Mitigated construction emissions were calculated assuming implementation of the following CalEEMod construction mitigation measures. Dust emission reductions based on Table 8-2 in MBUAPCD CEQA Air Quality Guidelines (Monterey Bay Unified Air Pollution Control District 2008):

- Incorporation of diesel particulate filters capable of 25% reduction on all construction equipment pieces;
- Implementation of soil stabilizers on all unpaved roads achieving an 80% reduction in PM10 emissions;
- Replacement of ground cover achieving a 5% reduction in PM10 emissions;
- Watering exposed areas 3 times daily, achieving a 61%

Operations

Two types of air pollutant sources are expected during operation of the proposed project: area and mobile sources. Area sources are sources that can include area-wide, natural, and groups of stationary sources (such as dry cleaners and gas stations). At the proposed project site, area sources include emissions from natural gas combustion for heating requirements (i.e., water heater and furnace), landscaping activities, consumer products (i.e., automotive products, household cleaners, personal care products), and periodic paint emissions from facility upkeep. The primary operational emissions associated with the project are ozone precursors (ROG and NO_X), CO, PM10, and PM2.5

Project operational emissions of area and mobile sources were modeled with the CalEEMod emissions model. Default model values for Monterey County were used to estimate mobile, area, energy, waste water, and solid waste emissions. Default 2011 CalEEMod Pacific Gas & Electric CO_2, CH_4, and N_20 emission factors were assumed for Monterey County, while default Monterey County CalEEMod values for windspeed, precipitation frequency, and climate zone were assumed for an urban setting.

Mobile sources are sources of emissions associated with vehicle trips, and include employees, deliveries, and maintenance activities. Trip generation information data used in the analysis is based on trip generation data provided by the project traffic engineers, Fehr & Peers (Fehr & Peers 2011). Table E-5 summarizes the trip rates, and operational acreage for land uses associated with the proposed project.

Implementation of the proposed project would result in the loss of carbon stock and carbon sequestration due to removal of trees and other perennial vegetative matter due to development. These are referred to as “land cover change emissions” below:

- Loss of carbon stock is a one-time emission due to removal of natural vegetation and soils. As the trees are unlikely to be used for commercial products and are more likely to be chipped

(which eventually results in the release of carbon), it is assumed that tree removal results in loss of 100% of the carbon stock. These emissions were estimated by identifying the acreages of land cover change and then multiplying by factor values to the amount of estimated stock for that land cover.

- Loss of carbon sequestration is an annual emission due to conversion of naturally vegetated areas to urban uses. Under existing conditions, the natural land covers uptake carbon which is sequestered in vegetative matter (wood) and soils. These emissions were estimated by identifying the acreages of land cover change and then multiplying by factor values to the amount of estimated annual carbon sequestration loss for that land cover

Emissions associated with carbon stock and carbon sequestration due to removal of trees and other perennial vegetative matter were estimated based on data provided in Table E-6 and default CalEEMod vegetative values.

CO Hotspot Modeling

An evaluation to determine whether CO hot spots would occur at roadway intersections in the vicinity of the proposed project was conducted through CO dispersion modeling. The effects of operation-related CO emissions were evaluated using the CALINE4 dispersion model developed by the California Department of Transportation (Caltrans) (Benson 1989). CALINE4 treats each segment of a roadway as a separate emission source producing a plume of pollutants that disperses downwind. Pollutant concentrations at any specific location are calculated using the total contribution from overlapping pollution plumes originating from the sequence of roadway segments. CO modeling was conducted for six conditions: Existing (2011) no project, existing with project, baseline (2015) no project, baseline with project, cumulative (2030) no project, and cumulative with project conditions. With project conditions included Option 1, new resort hotel at the Area M Spyglass Hill, and Option 2, new residential lots at the Area M Spyglass Hill.

Dispersion Modeling

Predicting the ambient air quality impacts of pollutant emissions requires an assessment of the transport, dispersion, chemical transformation, and removal processes that affect pollutant emissions after their release from a source. Gaussian dispersion models are frequently used for such analyses. The term "Gaussian dispersion" refers to a general type of mathematical equation used to describe the horizontal and vertical distribution of pollutants downwind from an emission source.

Gaussian dispersion models treat pollutant emissions as being carried downwind in a defined plume, subject to horizontal and vertical mixing with the surrounding atmosphere. The plume spreads horizontally and vertically with a reduction in pollutant concentrations as it travels downwind. Mixing with the surrounding atmosphere is greatest at the edge of the plume, resulting in lower pollutant concentrations outward (horizontally and vertically) from the center of the plume. This decrease in concentration outward from the center of the plume is treated as following a Gaussian ("normal") statistical distribution. Horizontal and vertical mixing generally occur at different rates. Because turbulent motions in the atmosphere occur on a variety of spatial and time scales, vertical and horizontal mixing also vary with distance downwind from the emission source.

CALINE4 Model

The ambient air quality effects of traffic emissions were evaluated using the CALINE4 dispersion model (Benson 1989). CALINE4 is a Gaussian dispersion model specifically designed to evaluate air quality impacts of roadway projects. Each roadway link analyzed in the model is treated as a sequence of short segments. Each segment of a roadway link is treated as a separate emission source producing a plume of pollutants that disperses downwind. Pollutant concentrations at any specific location are calculated using the total contribution from overlapping pollution plumes originating from the sequence of roadway segments.

When winds are essentially parallel to a roadway link, pollution plumes from all roadway segments overlap. This produces high concentrations near the roadway (near the center of the overlapping pollution plumes) and low concentrations well from the roadway (at the edges of the overlapping pollution plumes). When winds are at an angle to the roadway link, pollution plumes from distant roadway segments make essentially no contribution to the pollution concentration observed at a receptor location. Under such cross wind situations, pollutant concentrations near the highway are lower than under parallel wind conditions (fewer overlapping plume contributions), while pollutant concentrations away from the highway may be greater than would occur with parallel winds (near the center of at least some pollution plumes).

The CALINE4 model employs a "mixing cell" approach to estimating pollutant concentrations over the roadway itself. The size of the mixing cell over each roadway segment is based on the width of the traffic lanes of the highway (generally 12 feet per lane) plus an additional turbulence zone on either side (generally 10 feet on each side). Parking lanes and roadway shoulders are not counted as traffic lanes. The height of the mixing cell is calculated by the model.

Pollutants emitted along a highway link are treated as being well mixed within the mixing cell volume due to mechanical turbulence from moving vehicles and convective mixing due to the temperature of vehicle exhaust gases. Pollutant concentrations downwind from the mixing cell are calculated using horizontal and vertical dispersion rates, which are a function of various meteorological and ground surface conditions.

EMFAC2007 (Version 2.3) Model

Vehicle emissions rates for CO were evaluated using the ARB's EMFAC2007 (version 2.3) emission rate program and vehicle activity data from the proposed project's traffic analysis (Fehr & Peers 2011). The EMission FACtors (EMFAC) model calculates emission rates from all motor vehicles, such as passenger cars to heavy-duty trucks, operating on highways, freeways, and local roads in California. It can estimate emission rates of 1965 and newer vehicles and provides emission rates for gasoline, diesel, or electricity powered vehicles. The EMFAC2007 emissions inventory estimates are made for over 100 different technology groups and are reported for 10 broad vehicle classes segregated by usage and weight.

EMFAC2007 can analyze up to 45 model years for each vehicle class within each calendar year; for 24 hourly periods; for each month of the year; and for each district, basin, county and subcounty in California. EMFAC2007 estimates emission factors and emission inventories for the following primary pollutants: CO, hydrocarbons, NO_X, CO_2, particulate matter, oxides of sulfur, and lead. For the purposes of the CO hot spot analysis, only CO emissions factors were used.

Modeling Procedures

All assumptions regarding EMFAC2007 and CALINE4 are presented in Table E-7 and are detailed in the following sections.

Roadway and Traffic Conditions

Traffic volumes and operating conditions used in the modeling were obtained from the traffic analysis prepared for the proposed project by Fehr & Peers (Fehr & Peers 2011). CO emissions were modeled for existing (2011) no project, existing with project, baseline (2015) no project, baseline with project, cumulative (2030) no project, and cumulative with project conditions. With project conditions included Option 1, new resort hotel at the Area M Spyglass Hill, and Option 2, new residential lots at the Area M Spyglass Hill. Free-flow traffic speeds were adjusted to reflect congested speeds using methodology from the Transportation Carbon Monoxide Protocol (Garza, et. al. 1997). A speed of 1 mile per hour (mph) was used to represent a worst-case scenario. An aerodynamic roughness coefficient of 100 centimeters was used for all modeling. This value is recommended by the CO Protocol for suburban areas. CO modeling was conducted at five intersections: SR 68/Skyline Forest Drive, SR 68/Carmel Hill Professional Center, SR 68/SR 1 Southbound Off-Ramp, SR 1/Carpenter Street, and Congress Road/SFB Morse Drive intersections. These intersections were modeled because they were identified by the traffic engineers as having the greatest peak-hour traffic volumes and worst delay in the project area (Fehr and Peers 2011).

Vehicle Emission Rates

Vehicle emission rates were determined using the California Air Resources Board's EMFAC2007 (version 2.3) emission rate program. EMFAC2007 modeling procedures followed the guidelines recommended by Caltrans (California Department of Transportation 2003). The program assumed average Monterey County regional traffic data operating during the winter months. A mean minimum January temperature of 43 degrees Fahrenheit and humidity of 30% were assumed. Emissions factors were calculated for 1 mph for the years 2011, 2015, and 2030.

Roadway Link Geometry

Each intersection is represented in CALINE4 as a collection of roadway links. Each link is a straight segment of road with a fixed traffic volume and emissions factor. The roadway link geometry was determined using methodology recommended in the *Transportation Project-Level Carbon Monoxide Protocol* (Garza et. al. 1997). To accurately model project area intersection traffic volume and emissions factors, each intersection was separated into four links: eastbound, westbound, northbound and southbound directions of travel. Each roadway link was assumed to be at-grade (level with the ground) with a link height of zero. Each link coincides with the centerline of the traveled way (i.e., traffic lanes not including shoulders) for the given intersection. The intersection center is located at the origin and each roadway link extends 500 feet away from the intersection in the appropriate direction to allow accurate dispersion and mixing.

Receptor Locations

CO concentrations were estimated at four receptor locations located at each of the intersections analyzed, for a total of 20 receptors. The receptors were placed 3 meters from the traveled way of

each intersection at the boundary of the mixing zone to represent a worst-case scenario. Receptor heights were set at 5.9 feet.

Meteorological Conditions

Meteorological inputs to the CALINE4 model were determined using methodology recommended in Air Quality Technical Analysis Notes (California Department of Transportation 1988). The meteorological conditions used in the modeling represent a calm winter period. Worst-case wind angles were modeled to determine a worst-case concentration for each receptor. The meteorological inputs include: 0.5 meter per second wind speed; ground-level temperature inversion (atmospheric stability class G); wind direction standard deviation equal to 5°; ambient temperature of 20° centigrade); altitude above sea level of 36 feet; and a mixing height of 1,000 meters.

Background Concentrations and 8-Hour Values

To account for sources of CO not included in the modeling, a background concentration of 2.2 ppm was added to the modeled cumulative 1-hour values, while a background concentration of 0.85 ppm was added to the modeled cumulative 8-hour values. Background concentration data for 1- and 8-hour values were obtained from the EPA's Air Data webpage (U.S. Environmental Protection Agency 2009). The maximum 1- and 8-hour value for the years 2008–2010 measured at the Salinas monitoring station was used as a background concentration. Eight-hour modeled values were calculated from the 1-hour values using a persistence factor of 0.6. Background concentrations for future years were assumed to be the same as those for the current year. Actual 1- and 8 hour background concentrations in future years would likely be lower than those used in the CO modeling analysis because the trend in CO emissions and concentrations is decreasing because of continuing improvements in engine technology and the retirement of older, higher-emitting vehicles.

Dispersion Modeling (HRA screening)

A screening-level assessment of potential health risks from exposure of existing sensitive receptors to DPM emissions from construction exhaust was performed using methodology developed by ICF consistent with Office of Environmental Health Hazard Assessment (OEHHA) methodology and guidance using emission factors for off-road equipment from the URBEMIS and EMFAC2007 models and the CALS3QHCR and ISCST3 dispersion models. The screening-level analysis of pollutant concentrations and associated health risks was conducted for the Pebble Beach Links Driving Range Relocation to Collins Field. Relocation of the Driving Range, as it represents a worst-case scenario for potential health risks from construction-related exhaust emissions due to the proximity of nearby sensitive receptors within 100 feet directly across Ondulado Road and across Alva Lane, as well as the anticipated level of construction activity required (i.e., earthwork would entail approximately 36,500 cubic yards of cut material and 27,800 cubic yards of fill material, representing the greatest amount of earthwork in close proximity to existing sensitive land uses). Health risks at receptors nearby other construction areas were scaled from the health risks calculated at the Driving Range Relocation to Collins Field based on distances of sensitive receptors to the project development areas. It was assumed that construction activities would require 49 heavy duty diesel truck trips per day, while Table E-8 summarizes off-road construction equipment activity assumptions.

Mitigation

Emissions were estimated for estimated for two scenarios: 1) business-as-usual (BAU), which is generally defined as emissions before greenhouse gas emission reduction requirements or incentives, and 2) emissions with mitigation, including statewide measures and requirements (e.g., low-carbon fuel standard [LCFS], Pavley I (Assembly Bill 1493) standards. Emission factors to represent BAU emissions for mobile source emissions adjusted using values from Table 4.4 of the CalEEMod User's Guide to characterize emissions without the LCFS and Pavley standards (ENVIRON 2011). Based on the revised California emissions inventory and Scoping Plan Reduction Strategies released on July 2011, mitigated operational emissions were reduced based on the reductions presented in Table E-9.

In addition, mitigated operational emission also include the following strategies:

- 20% improvement beyond Title 24 requirements;
- Installation of low-flow bathroom faucets (24% reduction in flow);
- Installation of low-flow kitchen faucets (18% reduction in flow);
- Installation of low-flow toilets (20% reduction in flow);
- Installation of low-flow showers (20% reduction in flow);
- Use of water-efficient irrigation systems (6.1% reduction in flow);
- Installation of low-flow bathroom faucets (24% reduction in flow); and
- Institution of recycling and composting services (50% reduction in waste disposed)

References Cited

Printed References

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Table E-1. Construction Schedule and Phasing

CONSTRUCTION PHASE	MONTH-YEAR
Development Site (Duration)	11-11 12-11 1-12 2-12 3-12 4-12 5-12 6-12 7-12 8-12 9-12 10-12 11-12 12-12 1-13 2-13 3-13 4-13 5-13 6-13 7-13 8-13 9-13 10-13 11-13 12-13 1-14 2-14 3-14 4-14 5-14 6-14 7-14 8-14 9-14 10-14 11-14 12-14 1-15 2-15 3-15 4-15 5-15 6-15 7-15 8-15 9-15
PHASE I	
Residential Lot Subdivisions (66 Lots, all except Area V and Corporate Yard)	G G G P P P
(6 months)	
Congress Rd/ Lopez Rd Intersection Improvements	G P
(2 months)	
SR 1/SR 68/17-Mile Dr Intersection Improvements	G G G P P P P P P
(9 months)	
Congress Rd /17-Mile Dr Intersection Improvements	G P
(2 months)	
New Employee Parking Lot (SBI)	G G P P
(4 months)	
Parking and Circulation Reconstruction (PBL)	G G G B B B B
(9 months)	
Pebble Beach Links Driving Range Relocation from Area V to Collins Field	G G G P B B B
(8 months)	
PHASE II	
Meeting Facility Expansion (PBL)	G B B B B B B B B AC
(10 months)	
New Colton Building (PBL)	G G B B B B B B B AC
(10 months)	
Portola Rd/ Stevenson Dr Intersection Improvements	G P
(2 months)	
Equestrian Center Reconstruction/Special Events Area	G G B B B B P
(8 months)	
Lopez Rd/Sunridge Rd Intersection Improvements	G P
(2 months)	
Residential Lot Subdivisions (10 Lots, Corporate Yard)	G G G P P P
(6 months)	
Conference Center Expansion, Meeting Rooms (SBI)	G B B B B B B B B AC
(10 months)	
PHASE III	
Conference Center Expansion, Ballroom (SBI)	G B B B B B B
(10 months)	
Fairway One Reconstruction (PBL)	G G B B B B B
(16 months)	
New Guest Cottages (SBI)	
(16 months)	
PHASE IV	
Residential Lot Subdivisions (14 Lots, Area V)	
(5 months)	
Area M Spyglass Hill, Option 1 New Resort Hotel	
(29 months)	
Area M Spyglass Hill, New Residential Lots (10 Lots)	

Notes:

PBL = The Lodge at Pebble Beach

SBI = The Inn at Spanish Bay

G = grading / demo

Table E-1. Construction Schedule and Phasing

CONSTRUCTION PHASE

Development Site (Duration)	10-15	11-15	12-15	1-16	2-16	3-16	4-16	5-16	6-16	7-16	8-16	9-16	10-16	11-16	12-16	1-17	2-17	3-17	4-17	5-17	6-17	7-17	8-17	9-17	10-17	11-17	12-17	1-18	2-18	3-18	4-18	5-18	6-18	7-18	8-18	9-18	10-18	11-18	12-18	1-19	2-19	3-19	4-19	5-19	6-19	7-19	8-19	9-19	10-19
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Notes:

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G = grading / demo

Table E-1. Construction Schedule and Phasing

CONSTRUCTION PHASE

Development Site (Duration)	11-19	12-19	1-20	2-20	3-20	4-20	5-20	6-20	7-20	8-20	9-20	10-20	11-20	12-20	1-21	2-21	3-21	4-21	5-21	6-21	7-21	8-21	9-21	10-21	11-21	12-21	1-22	2-22	3-22	4-22	5-22	6-22	7-22
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PHASE IV																																	
Residential Lot Subdivisions (14 Lots, Area V)					G	G	G	P	P																								
(5 months)																																	
Area M Spyglass Hill, Option 1 New Resort Hotel					G	G	G	G	G	G	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	P	AC	AC	AC
(29 months)																																	
Area M Spyglass Hill, New Residential Lots (10 Lots)					G	G	G	P	P	P																							

Notes:

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Table E-2. CalEEMod Construction Activity Assumptions

Project Element	Phase	Equipment	Amount	Hours	Horsepower	LoadFactor
Pebble Beach - SBI Conference Center Meeting	Grading	Concrete/Industrial Saws	1	8	81	0.73
	Grading	Rubber Tired Dozers	1	1	358	0.59
	Grading	Tractors/Loaders/Backhoes	2	6	75	0.55
	Building Construction	Cranes	1	4	208	0.43
	Building Construction	Forklifts	2	6	149	0.3
	Building Construction	Tractors/Loaders/Backhoes	2	8	75	0.55
	Architechtural Coating	Air Compressors	1	6	78	0.48
	Architechtural Coating	Cement and Mortar Mixers	4	6	9	0.56
	Architechtural Coating	Pavers	1	7	89	0.62
	Architechtural Coating	Rollers	1	7	84	0.56
	Architechtural Coating	Tractors/Loaders/Backhoes	1	7	75	0.55
Pebble Beach - Colton Building	Grading	Concrete/Industrial Saws	1	8	81	0.73
	Grading	Rubber Tired Dozers	1	1	358	0.59
	Grading	Tractors/Loaders/Backhoes	2	6	75	0.55
	Building Construction	Cranes	1	4	208	0.43
	Building Construction	Forklifts	2	6	149	0.3
	Building Construction	Tractors/Loaders/Backhoes	2	8	75	0.55
	Architectural Coatings	Air Compressors	1	6	78	0.48
Pebble Beach - Driving Range	Grading	Excavators	2	8	157	0.57
	Grading	Graders	1	8	162	0.61
	Grading	Rubber Tired Dozers	1	8	358	0.59
	Grading	Scrapers	2	8	356	0.72
	Grading	Tractors/Loaders/Backhoes	2	8	75	0.55
	Paving	Cranes	1	7	208	0.43
	Paving	Forklifts	3	8	149	0.3
	Paving	Generator Sets	1	8	84	0.74
	Paving	Pavers	2	8	89	0.62
	Paving	Paving Equipment	2	8	82	0.53
	Paving	Rollers	2	8	84	0.56
	Paving	Tractors/Loaders/Backhoes	3	7	75	0.55
	Paving	Welders	1	8	46	0.45
	Building Construction	Cranes	1	7	208	0.43
	Building Construction	Forklifts	3	8	149	0.3
	Building Construction	Generator Sets	1	8	84	0.74
	Building Construction	Tractors/Loaders/Backhoes	3	7	75	0.55
	Building Construction	Welders	1	8	46	0.45
Pebble Beach - PBL Meeting Facility	Grading	Concrete/Industrial Saws	1	8	81	0.73
	Grading	Rubber Tired Dozers	1	1	358	0.59
	Grading	Tractors/Loaders/Backhoes	2	6	75	0.55
	Building Construction	Cranes	1	4	208	0.43
	Building Construction	Forklifts	2	6	149	0.3
	Building Construction	Tractors/Loaders/Backhoes	2	8	75	0.55
	Architectural Coatings	Air Compressors	1	6	78	0.48
Pebble Beach - PBL Parking and Circulation	Grading	Excavators	1	8	157	0.57
	Grading	Graders	1	8	162	0.61
	Grading	Rubber Tired Dozers	1	8	358	0.59
	Grading	Tractors/Loaders/Backhoes	3	8	75	0.55
	Paving	Cement and Mortar Mixers	2	6	9	0.56
	Paving	Pavers	1	8	89	0.62
	Paving	Paving Equipment	2	6	82	0.53
	Paving	Rollers	2	6	84	0.56
	Paving	Tractors/Loaders/Backhoes	1	8	75	0.55
Pebble Beach - Residential (No V/Corp Yard)	Grading	Excavators	2	8	157	0.57
	Grading	Graders	1	8	162	0.61
	Grading	Rubber Tired Dozers	1	8	358	0.59
	Grading	Scrapers	2	8	356	0.72
	Grading	Tractors/Loaders/Backhoes	2	8	75	0.55
	Paving	Pavers	2	8	89	0.62
	Paving	Paving Equipment	2	8	82	0.53
	Paving	Rollers	2	8	84	0.56

Project Element	Phase	Equipment	Amount	Hours	Horsepower	LoadFactor
Pebble Beach - Equestrian/Special Events	Grading	Excavators	2	8	157	0.57
	Grading	Graders	1	8	162	0.61
	Grading	Rubber Tired D	1	8	358	0.59
	Grading	Scrapers	2	8	356	0.72
	Grading	Tractors/Loade	2	8	75	0.55
	Building Constr	Cranes	1	7	208	0.43
	Building Constr	Forklifts	3	8	149	0.3
	Building Constr	Generator Sets	1	8	84	0.74
	Building Constr	Tractors/Loade	3	7	75	0.55
	Building Constr	Welders	1	8	46	0.45
	Paving	Pavers	2	8	89	0.62
	Paving	Paving Equipme	2	8	82	0.53
	Paving	Rollers	2	8	84	0.56
Pebble Beach - Fairway 1	Grading	Graders	1	8	162	0.61
	Grading	Rubber Tired D	1	8	358	0.59
	Grading	Tractors/Loade	2	7	75	0.55
	Building Constr	Cranes	1	8	208	0.43
	Building Constr	Forklifts	2	7	149	0.3
	Building Constr	Generator Sets	1	8	84	0.74
	Building Constr	Tractors/Loade	1	6	75	0.55
	Building Constr	Welders	3	8	46	0.45
	Paving	Air Compressor	1	6	78	0.48
	Paving	Cement and Mc	1	8	9	0.56
	Paving	Pavers	1	8	89	0.62
	Paving	Paving Equipme	1	8	82	0.53
	Paving	Rollers	2	8	84	0.56
	Paving	Tractors/Loade	1	8	75	0.55
	Architectural C	Air Compressor	1	6	78	0.48
Pebble Beach - Hotel (Area M Spyglass (Opt 1)	Grading	Excavators	2	8	157	0.57
	Grading	Graders	1	8	162	0.61
	Grading	Rubber Tired D	1	8	358	0.59
	Grading	Scrapers	2	8	356	0.72
	Grading	Tractors/Loade	2	8	75	0.55
	Building Constr	Cranes	1	7	208	0.43
	Building Constr	Forklifts	3	8	149	0.3
	Building Constr	Generator Sets	1	8	84	0.74
	Building Constr	Tractors/Loade	3	7	75	0.55
	Building Constr	Tractors/Loade	3	7	75	0.55
	Building Constr	Welders	1	8	46	0.45
	Paving	Air Compressor	1	6	78	0.48
	Paving	Pavers	2	8	89	0.62
	Paving	Paving Equipme	2	8	82	0.53
	Paving	Rollers	2	8	84	0.56
	Architechtural C	Air Compressor	1	6	78	0.48
Pebble Beach - Residential (Area M Spyglass (Opt 2))	Grading	Excavators	1	8	157	0.57
	Grading	Graders	1	8	162	0.61
	Grading	Rubber Tired D	1	8	358	0.59
	Grading	Tractors/Loade	3	8	75	0.55
	Paving	Cement and Mc	2	6	9	0.56
	Paving	Pavers	1	8	89	0.62
	Paving	Paving Equipme	2	6	82	0.53
	Paving	Rollers	2	6	84	0.56
	Paving	Tractors/Loade	1	8	75	0.55
Pebble Beach - Residential (V)	Grading	Excavators	1	8	157	0.57
	Grading	Graders	1	8	162	0.61
	Grading	Rubber Tired D	1	8	358	0.59
	Grading	Tractors/Loade	3	8	75	0.55
	Paving	Cement and Mc	2	6	9	0.56
	Paving	Pavers	1	8	89	0.62
	Paving	Paving Equipme	2	6	82	0.53
	Paving	Rollers	2	6	84	0.56
	Paving	Tractors/Loade	1	8	75	0.55

Table E-2. CalEEMod Construction Activity Assumptions

Project Element	Phase	Equipment	Amount	Hours	Horsepower	LoadFactor
Pebble Beach - SBI Conference Center Ballroom	Grading	Concrete/Industrial Saws	1	8	81	0.73
	Grading	Rubber Tired Dozers	1	1	358	0.59
	Grading	Tractors/Loaders/Backhoes	2	6	75	0.55
	Building Construction	Cranes	1	4	208	0.43
	Building Construction	Forklifts	2	6	149	0.3
	Building Construction	Tractors/Loaders/Backhoes	2	8	75	0.55
	Architechtural Coating	Air Compressors	1	6	78	0.48
	Architechtural Coating	Cement and Mortar Mixers	4	6	9	0.56
	Architechtural Coating	Pavers	1	7	89	0.62
	Architechtural Coating	Rollers	1	7	84	0.56
	Architechtural Coating	Tractors/Loaders/Backhoes	1	7	75	0.55
Pebble Beach - SBI Conference Center Meeting	Grading	Concrete/Industrial Saws	1	8	81	0.73
	Grading	Rubber Tired Dozers	1	1	358	0.59
	Grading	Tractors/Loaders/Backhoes	2	6	75	0.55
	Building Construction	Cranes	1	4	208	0.43
	Building Construction	Forklifts	2	6	149	0.3
	Building Construction	Tractors/Loaders/Backhoes	2	8	75	0.55
	Architechtural Coating	Air Compressors	1	6	78	0.48
	Architechtural Coating	Cement and Mortar Mixers	4	6	9	0.56
	Architechtural Coating	Pavers	1	7	89	0.62
	Architechtural Coating	Rollers	1	7	84	0.56
	Architechtural Coating	Tractors/Loaders/Backhoes	1	7	75	0.55
Pebble Beach - SBI New Employee Parking Lot	Grading	Excavators	1	8	157	0.57
	Grading	Graders	1	8	162	0.61
	Grading	Rubber Tired Dozers	1	8	358	0.59
	Grading	Tractors/Loaders/Backhoes	3	8	75	0.55
	Paving	Cement and Mortar Mixers	2	6	9	0.56
	Paving	Pavers	1	8	89	0.62
	Paving	Paving Equipment	2	6	82	0.53
	Paving	Rollers	2	6	84	0.56
	Paving	Tractors/Loaders/Backhoes	1	8	75	0.55
Pebble Beach - SBI Guest Cottages	Grading	Excavators	1	8	157	0.57
	Grading	Graders	1	8	162	0.61
	Grading	Rubber Tired D	1	8	358	0.59
	Grading	Tractors/Loade	3	8	75	0.55
	Paving	Cement and Mo	2	6	9	0.56
	Paving	Pavers	1	8	89	0.62
	Paving	Paving Equipme	2	6	82	0.53
	Paving	Rollers	2	6	84	0.56
	Paving	Tractors/Loade	1	8	75	0.55
	Building Constr	Cement and Mo	2	6	9	0.56
	Building Constr	Cranes	1	7	208	0.43
	Building Constr	Forklifts	3	8	149	0.3
	Building Constr	Generator Sets	1	8	84	0.74
	Building Constr	Pavers	1	8	89	0.62
	Building Constr	Paving Equipme	2	6	82	0.53
	Building Constr	Rollers	2	6	84	0.56
	Building Constr	Tractors/Loade	3	7	75	0.55
	Building Constr	Tractors/Loade	1	8	75	0.55
	Building Constr	Welders	1	8	46	0.45
	Architectural Co	Air Compressor	1	6	78	0.48

Table E-3. Construction Soil Hauling and Grading Assumptions

Location	Site Component	Cut (cy)	Fill (cy)	Net (cy)	Acres to be Graded	Maximum Amount of Daily Grading (acres)
The Lodge at Pebble Beach	Meeting Facility Expansion	0	0	0	0.00	0.00
	New Colton Building	5,500	0	5,500	0.50	0.50
	Fairway One Reconstruction	4,600	4,300	300	2.39	1.00
	Parking Improvements	9,000	600	8,400	2.55	1.00
The Inn at Spanish Bay	Conference Center Expansion	0	0	0	0.00	0.00
	New Guest Cottage Buildings	2,400	2,400	0	3.13	1.00
	New Employee Parking	7,300	7,300	0	3.21	1.00
Collins Field/ Equestrian Center/Special Events Area	Driving Range	36,500	27,800	8,700	15.58	2.00
	Equestrian Center Reconstruction	5,800	6,800	-1,000	10.86	2.00
	Special Events Area	8,700	400	8,300	11.99	2.00
Area M - Spyglass Hill	Resort Hotel Option	99,800	51,500	48,300	15.31	2.00
	Residential Subdivision Option	48,500	38,700	9,800	10.09	2.00
Residential Lot Subdivisions						
Area F-2 *(Gowen cypress present)*	16 lots	1,500	1,500	0	1.24	0.50
Area I-2	16 lots	100	100	0	0.23	0.23
Area J	5 lots	100	100	0	0.09	0.09
Area K	8 lots	300	300	0	0.43	0.43
Area L	10 lots	1,500	1,500	0	1.18	0.50
Area U	7 lots	0	6,000	-6,000	2.97	1.00
Area V	14 lots	800	16,480	-15,680	3.65	1.00
Collins Residence	4 lots	0	7,800	-7,800	1.96	1.00
Corporate Yard	10 lots	58,000	75,000	-17,000	9.81	2.00
All except V/CY		3,500	17,300	-13,800	8	3.75
Roadway Improvements						
Highway 1/ Highway 68/ 17-Mile Drive	Interchange Reconfiguration	621	402	219	2.48	1.00
Congress Road/17-Mile Drive	Intersection Improvement	0	0	0	0.00	0.00
Congress Road/ Lopez Road	Intersection Improvement	4,100	350	3,750	0.71	0.50
Sunridge Road/ Lopez Road	Intersection Improvement	40	10	30	0.00	0.00
Portola Road/ Stevenson Drive	Intersection Realignment	50	50	0	0.33	0.33
	Total with Area M Hotel Option	**250,211**	**227,992**	**22,219**	**98.70**	**24.83**
	Total with Area M Subdivision Option	**198,911**	**215,192**	**-16,281**	**93.48**	**24.83**

Table E-4. Road Construction Emissions Model Assumptions

Intersection Name	Congress Rd-Lopez Rd	SR 1/SR 68/17-Mile Dr	Congress Rd-17-Mile Dr	Portola Rd- Stevenson Dr	Lopez Rd-Sunridge Rd
Construction Start Year	2012	2012	2012	2014	2014
Project Type	Road Widening	Road Widening	Road Widening	Road Widening	Road Widening
Construction Duration (Months)	2.0	9.0	2.0	2.0	2.0
Predominant Soil/Site Type	Sand Gravel	Sand Gravel	Sand Gravel	Sand Gravel	Sand Gravel
Project Length (Miles)	0.5	1	0.5	0.5	0.5
Total Project Area (acres)	0.7	2.5	0.0	0.3	0.0
Maximum Area Disturbed/Day (acres)	0.5	1.0	0.0	0.3	0.0
Water Trucks Used?	Yes	Yes	Yes	Yes	Yes
Soil Imported (yd^3/day)	820.0	621.0	0.0	50.0	40.0
Soil Exported (yd^3/day)	70.0	402.0	0.0	50.0	10.0
Average Truck Capacity (yd^3)	20.0	20.0	20.0	20.0	20.0

Table E-5. Operational Assumptions

Project Element	Land Use Type	Trip Generation	Size Metric	Acreage
Pebble Beach - SBI Conference Center Meeting	General Office Building	3.96	1000sqft	0.09
Pebble Beach - Colton Building	Hotel	20	Room	0.5
Pebble Beach - Driving Range	Golf Course	15.58	Acre	15.58
Pebble Beach - Equestrian/Special Events	Arena	22.85	Acre	22.85
Pebble Beach - Fairway 1	Hotel	35	Room	2.39
Pebble Beach - Hotel (Area M Spyglass (Opt 1)	Hotel	100	Room	15.31
Pebble Beach - PBL Meeting Facility	General Office Building	2.1	1000sqft	0.05
Pebble Beach - PBL Parking and Circulation	Parking Lot	3.21	Acre	3.21
Pebble Beach - Residential (Area M Spyglass (Opt 2))	Single Family Housing	10	Dwelling Unit	3.25
Pebble Beach - Residential (No V/Corp Yard)	Single Family Housing	64	Dwelling Unit	20.78
Pebble Beach - Residential (V)	Single Family Housing	14	Dwelling Unit	4.55
Pebble Beach - SBI Conference Center Ballroom	General Office Building	3.96	1000sqft	0.09
Pebble Beach - SBI Conference Center Meeting	General Office Building	3.96	1000sqft	0.09
Pebble Beach - SBI Guest Cottages	Hotel	40	Room	3.13
Pebble Beach - SBI New Employee Parking Lot	Parking Lot	3.21	Acre	3.21

Table E-6. Carbon Stock and Carbon Sequestration Assumptions

Calculation of Existing and Future Tree Stock and Sequestration, Pebble Beach Company's Del Monte Forest Plan									
				Monterey Pine (MP)			Coast Live Oak (CLO)		
Area	Total Acres	Removed Acres	Preserved Acres	Total Trees	Removed Trees	Preserved Trees	Total Trees	Removed Trees	Preserved Trees
Pebble Beach Lodge	0.00	0.00	0.00	19	19	0	100	100	0
The Inn at Spanish Bay	7.65	6.01	0.00	478	478	0	86	86	0
Collins Field/Eq. Center/ Special Events	4.94	3.79	0.00	489	489	0	32	35	0
Area M - Hotel	6.50	5.00	0.00	573	389	184	0	0	0
Area M - Residential	6.50	2.43	0.00	573	235	338	0	0	0
Residential Lot Subdivisions (without Area V and Corporate Yard	641.81	24.77	580.82	107,487.00	4,040.00	98,166.00	12,603.00	696.00	11,363.00
V	17.65	1.19	12.76	2,445	165	1,767	121	11	121
Collins Residence	0.00	0.00	0.00	2	2	0	25	25	0
Corp Yard	4.25	0.00	4.25	365	8	357	39	1	38
Roadway Improvements	0.73	0.73	0.00	95	95	0	1	1	0
Total (with Area M hotel)	**683.53**	**41.49**	**597.83**	**111,953.00**	**5,685.00**	**100,474.00**	**13,007.00**	**955.00**	**11,522.00**
Total (with Area M resid.)	**683.53**	**38.92**	**597.83**	**111,953.00**	**5,531.00**	**100,628.00**	**13,007.00**	**955.00**	**11,522.00**
Source for Tree Data and Forested Acres: WWD, Biological Impact Calculations, 09/20/11; some totals may differ from WWD due to rounding. Source for Carbon Stock & Sequestration Factors: CalEEMod.									

Table E-7. EMFAC2007 and CALINE4 Modeling Assumptions

EMFAC2007	**CO emissions factors (g/mile)**
2011	10.378
2015	6.921
2030	2.431
CALINE4	
aerodynamic roughness coefficient	100 cm
altitude	36 feet
temperature	20°C
wind speed	0.5 mph
atmospheric stability	7 (class G)
wind direction	worst case
wind direction standard deviation	5°
mixing height	1000 meters
background CO concentration	
1 hr	2.2 ppm
8 hr	0.9 ppm
roadway link length	500 feet
link type	at-grade
link height	0 meters

Sources: Garza et. al. 1997; U.S. Environmental Protection Agency 2009.

Table E-8. Health Risk Assessment Assumptions

Grading/Earthwork Phase					**Emission Factor (g/hr)**	
Equipment	**Equipment Number**	**Horsepower**	**Load Factor**	**Hours Per day**	**ROG**	**PM**
Rubber Tired Dozers	1	357	0.3685	6	5.617563189	2.833037747
Tractors/Loaders/Backhoes	1	108	0.4087	7	1.945551393	1.533646136
Graders	1	174	0.4355	6	3.266955015	2.009747361
Water Trucks	1	189	0.4824	8	2.607432593	1.097932707
Paving Phase					**Emission Factor (g/hr)**	
Equipment	**Equipment Number**	**Horsepower**	**Load Factor**	**Hours Per day**	**ROG**	**PM**
Paving Equipment	2	104	0.40	6	2.639242865	1.990393827
Pavers	1	100	0.36	7	2.634878105	1.979093608
Rollers	1	95	0.36	7	1.920917544	1.48567781
Tractors/Loaders/Backhoes	1	108	0.41	7	1.945551393	1.533646136
Cement and Mortar Mixers	4	10	0.38	6	0.147716339	0.06051694

Table E-9. Scoping Plan Reduction Strategies[1]

Recommended Reduction Strategies	Sector	BAU	% reduction from BAU
Energy Efficiency - Electricity · Building and appliance energy efficiency and conservation · Increase CHP generation	Electricity	122.4	6.4%
Renewable Portfolio Standard (20% by 2010) Renewables Electricity Standard (33% by 2020)	Electricity	122.4	19.1%
Energy Efficiency - Natural Gas · Building and appliance energy efficiency and conservation · Solar Water Heating	Res/Commercial Natural Gas	38.2	11.0%
California Light-Duty Vehicle GHG Standards · Implement Pavley I standards (AB 1493) · Develop Advanced Clean Car Standards	On-Road Passenger Transportation	153.1	19.5%
Low Carbon Fuel Standard	On-Road/off-Road Transportation/Unspecified	197.2	7.6%

[1] Based on CalEEMod data, implementagion measures to achieve a 20% reduction beyone Title 24 achieves a 10% reduction in energy GHG emissions.