

Limited Air Quality Study & Climate Action Plan Checklist Alpine 21 Project

San Diego County

Prepared for:

Alpine 21, LLC.

5295 Beachcomber Court
San Diego, Ca. 92130

Prepared by:



November 2019 (Revision-3 June 2020)

Understanding of Project

Alpine 21, LLC is proposing to construct private roads, pads, and related infrastructure for 20 single-family residential (SFR) lots on approximately 81 acres in the unincorporated community of Alpine, California, just north of Interstate 8 and about ¼ mile west of East Victoria Drive. All SFR lots will be one gross acres or greater in size. The Project is scheduled to be completed in two phases, with Phase 1 consisting of 11 SFR lots in the northern portion property and Phase 2 consists of 9 SFR lots in the southern portion of the property. Each Phase is proposed to take approximately 4 to 5 months to complete and will be sequentially conducted. However, since the lots will be sold on an individual basis, the timing of future construction is unknown at this time. This analysis presents a worst-case scenario of all construction occurring starting the first calendar year following the culmination of the Project.

Criteria Methodology

The Alpine 21 Project (Project) consists of the site preparation, earth moving, and grading operations necessary to prepare building pads for future residential construction by other contractors. Since the future construction and operations of the residential are speculative and the responsibility of future owners of each pad, construction of and long-term operations of the residences including any landscaping, paving, and architectural coating are evaluated using the California Emissions Estimators Model (CalEEMod®), with CalEEMod defaults, and are presented below.

Therefore, a review of the Project reveals that potential sources of emissions from the grading operations would be:

- exhaust from off-road equipment,
- exhaust from employee vehicles,
- entrained road dust from on-road travel,
- fugitive dust from grading activity, and
- fugitive dust from bulldozing activity.

According to the latest grading plan, the Project anticipates 63,000 cubic yards (yd³) of earth cut and fill needed, therefore, since cut and fill are balanced on-site, no truck hauling would be needed to cover import or export.

All emission results are presented in pounds per day (ppd) to evaluate potential significance using the County's Guidelines for Determining Significance¹ (see Table 1). Details of emission calculations are included in Appendix A.

Table 1 – Screening Level Threshold for Criteria Pollutants²

Pollutant	Total Emissions
	(ppd)
Volatile Organic Compounds (VOC)	75
Nitrogen Oxides (NO _x)	250
Carbon Monoxide (CO)	550
Sulfur Oxides (SO _x)	250
Respirable Particulate Matter (PM ₁₀)	100
Fine Particulate Matter (PM _{2.5})	55

Construction Exhaust

Emissions related to the exhaust from construction equipment were estimated using off-road emissions factors, brake-horse-powers, and load factors as presented in the CalEEMod User's Guide,³ Appendix D and using equipment list and activity data supplied by your consultant. This analysis added an off-road water truck to the list that would be necessary to keep down fugitive dust. (See Appendix Table A4)

¹ Guidelines for Determining Significance – Air Quality. Land Use and Environment Group, County of San Diego. March 19, 2007.

² *ibid*

³ **California Emissions Estimator Model (CalEEMod®)** User's Guide, Version 2016.3.1. California Air Pollution Control Officers Association. September 2016.

Imported/Exported Fill

As the current grading plan for the Project shows the cut and fill will be balanced on-site (63,000 yd³ of cut and 63,000 yd³ of fill), there would be no need for hauling activities.

Employee Vehicle Exhaust

Emissions related to the exhaust from employee's commute vehicles were estimated using on-road emissions factors from the EMFAC2017 Model as presented in the EMFAC2017 Web Database. Data was derived from San Diego County emission rates for the 2020 Calendar Year. Annual average aggregated model year, speeds, and fuel use were obtained for light duty autos and trucks. A weighted average was generated from the emission factors and the vehicle miles travelled for each vehicle type/fuel use combination to generate an appropriate average emission factor to represent employee vehicle use. (See Appendix Table A3)

Number of employees were estimated using CalEEMod's default of 1.25 workers per equipment used, resulting one roundtrip per worker. The default CalEEMod employee home to work trip length was also applied.

Employee Entrained Road Dust

Vehicles that drive on both paved and unpaved roads generate fugitive dust by dispersing the silt from the roads. To estimate these entrained road dust, this analysis uses a formula from AP-42⁴ as presented in the CalEEMod User's Guide, Appendix A. Default values for the formula parameters were recommendations in the United States Environmental Protection Agency's Compilation of Air Pollutant Emission Factors (AP-42). For daily emissions, the default assumes the worst case of no precipitation. Vehicle miles travelled (VMT) were determined as above in Employee Vehicle Exhaust. (See Appendix Table A5)

Grading Fugitive Dust

Fugitive dust emissions from grading equipment passes are estimated using the methodology described in Section 11.9, of the AP-42 and presented in the CalEEMod User's Guide, Appendix A. This formula estimates the emission factor of PM₁₀ applying a scaling factor to that of PM₁₅ and the emission factor for PM_{2.5} is scaled from that of total suspended particulates (TSP).

The grading dust emissions are calculated by multiplying the emission factors with the total VMT for the grading equipment (i.e., grader). The grader VMT are estimated based on the dimensions of the grading area and the blade width of the grading equipment. Based on specific grading rates determined by South Coast Air Quality Management District in consultation with building estimator references, graders are assumed to grade 0.5 acres per day. (See Appendix Table A6)

⁴ AP 42, Fifth Edition Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources. United States Environmental Protection Agency. January 1995.

Bulldozing Fugitive Dust

Like the grading equipment passes emission estimation, the bulldozing emission factors for PM₁₀ and PM_{2.5} are scaled from those of PM₁₅ and TSP. Bulldozing emission factors were also based on equations in AP-42 and CalEEMod User's Guide Appendix A. The bulldozer equation gives a pounds-per-hour factor that is then applied to the hours the bulldozer is active per day. (See Appendix Table A7)

Dust Control Measures

This analysis presents the conservative worst-case conditions for temporary emissions of fugitive dust that could potentially create local concerns. Additionally, since fugitive dust emissions are regulated by the SDAPCD and the County, this analysis presents an estimated "controlled" emissions assuming compliance with SDAPCD and County requirements. The Project is required by SDAPCD's Rule 55 "Fugitive Dust Control" to not be operated in a manner that would discharge visible dust emissions into the atmosphere beyond the property line for a period or periods aggregating more than 3 minutes in any 60-minute period. In addition, the Project will be required to comply with County Code Section 87.428 and implement appropriate dust control measures adequate to prevent creation of a nuisance to persons or public or private property. Subsequently, the Project should implement the following dust control measures and emission totals presented in Table 2 represent reductions of approximately 50 percent for PM₁₀ emissions and 45 percent for PM_{2.5} emissions associated with compliance with SDAPCD and County requirements:

- Water exposed soil at least twice per day and limit vehicle speed for all construction vehicles to less than 15 mph on any unpaved surface at the site.
- Ensure that all disturbed areas not being actively utilized, be effectively stabilized and visible emissions limited to no greater than 20% opacity for dust emissions by using water, chemical stabilizers, dust suppressants, or other suitable material such as vegetative ground cover.
- Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 miles per hour.
- Replace ground cover or apply chemical stabilizers in disturbed areas as quickly as possible.

Summary of Overall Criteria Emissions from Project

Since Phase 1 and Phase 2 of the Project will be conducted sequentially with the same daily activity levels for each, Table 2 presents daily ppd emissions for construction activities related to the Project, which shows that neither the SDAPCD screening thresholds nor the County’s Significance Threshold would be exceeded. Details of emissions calculations are included in Appendix A.

Table 2 – Project Grading Maximum Daily Criteria Emissions (Phase 1 or Phase 2)

Emission Source	Criteria Emissions (ppd)					
	ROG	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}
Off-road Exhaust	1.6	11.6	18.7	0.0	0.7	0.7
Employee Exhaust	0.0	0.7	0.1	0.0	0.0	0.0
Entrained Road Dust	-----	-----	-----	-----	0.5	0.1
Grading Fugitive Dust	-----	-----	-----	-----	19.9	2.1
Bulldozing Fugitive Dust	-----	-----	-----	-----	4.5	0.6
<i>Uncontrolled Maximum Daily</i>	<i>1.6</i>	<i>12.3</i>	<i>18.8</i>	<i>0.0</i>	<i>25.6</i>	<i>3.6</i>
<i>Controlled Maximum Daily</i>	<i>1.6</i>	<i>12.3</i>	<i>18.8</i>	<i>0.0</i>	<i>12.8</i>	<i>2.0</i>
<i>Significance Threshold</i>	<i>75</i>	<i>550</i>	<i>250</i>	<i>250</i>	<i>100</i>	<i>55</i>
<i>Exceed Thresholds?</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>

Residential Construction and Operational Methodology

Since responsibility for the construction of and operations of any residential development rests with the individual future homeowners, presented in this analysis is a generic evaluation of potential emissions from construction and operation of all 20 sites. CalEEMod was used with all default assumptions. Start of construction was set as the beginning of the first calendar year following pad site construction, i.e. 2022, and all construction occurring within that calendar year. Presented in Table 3 are the construction-related emissions results provided by CalEEMod. In addition, Table 4 represents the operational-related emissions provided by CalEEMod (detailed CalEEMod output included as Appendix B).

Table 3 – Building Construction Maximum Daily Criteria Emissions

Emission Source	Criteria Emissions (ppd)					
	ROG	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}
Building Construction	1.7	15.8	16.6	0.0	0.9	0.8
Paving	1.2	11.2	15.0	0.0	0.7	0.6
Architectural Coating	59.3	1.4	1.9	0.0	0.1	0.1
Maximum Daily	59.3	15.8	16.6	0.0	0.9	0.8
<i>Significance Threshold</i>	75	550	250	250	100	55
<i>Exceed Thresholds?</i>	No	No	No	No	No	No

Table 4 – Building Operational Maximum Daily Criteria Emissions

Emission Source	Criteria Emissions (ppd)					
	ROG	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}
Operational	1.6	1.7	5.8	0.0	1.3	0.4
Maximum Daily	1.6	1.7	5.8	0.0	1.3	0.4
<i>Significance Threshold</i>	75	550	250	250	100	55
<i>Exceed Thresholds?</i>	No	No	No	No	No	No

Toxic Contaminants

During construction activities, off-road equipment will be operating, and the exhaust constituents include diesel particulate matter (DPM), which is known to the State as a toxic air contaminant (TAC). Generation of DPM from construction projects typically occur in a single area for a short period. The dose (of TACs) to which receptors are exposed to is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure a person has with the substance. Dose is positively correlated with time, meaning that a longer exposure period to a fixed amount of emissions would result in a higher exposure level for the Maximally Exposed Individual (MEI) and higher health risks. Project emissions will be temporary and short-term.

In addition, the distances from construction activity is also a determinant in degree of exposure to the MEI. The nearest proximity to existing residential is approximately 200 feet for Pad numbers 1 and 9 in Phase 1 and Pad number 18 in Phase 2. Many existing residential properties are within 0.5 miles from the Project site as well as two churches, the Queen Anne of the Angels Catholic Church (2569 W Victoria Dr) to the west and the Jehovah’s Witnesses of Alpine (3408 E Victoria Dr) to the east. Since exposure levels to toxics would decrease as receptors are further away from the construction site,

emissions from the Project would not be reasonably expected to affect the MEI. This is due to the dispersive properties of DPM⁵ and temporary short-term nature of the Project.

Odors

While offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and the SDAPCD. Because offensive odors rarely cause any physical harm and no requirements for their control are included in State or federal air quality regulations, the SDAPCD has no rules or standards related to odor emissions, other than its Nuisance Rule (Rule 51), which prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person.

The main source of potential odors during primary site preparation and any additional building construction activities would be diesel exhaust. While diesel exhaust is objectionable to some, concentrations of DPM will disperse rapidly further away from the Project site and likely not result in odor complaints.

Operational activity related to future residential development is not typically considered generators of odor per County Guidelines, thus no operational odor impacts are anticipated.

Greenhouse Gas Methodology

Greenhouse gases (GHGs) are defined under the California Global Warming Solutions Act of 2006 (AB 32) as carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Only CO₂, CH₄, and N₂O are of concern with a residential project, since the other GHGs are not emitted by this Project.

Each GHG has its individual global warming potential (GWP), which is the potential of a gas or aerosol to trap heat in the atmosphere. Individual GHG compounds have varying GWP and atmospheric lifetimes. The reference gas for the GWP is CO₂; CO₂ has a GWP of one. The calculation of the CO₂ equivalent (CO₂e) is a consistent methodology for comparing GHG emissions since it normalizes various GHG emissions to a consistent metric.

GHG emissions are based on total metric tons (tonnes) of CO₂e. During construction, the primary source of GHG is exhaust from on- and off-road vehicles and total construction emissions are generally amortized over 30 years and added to the operational emissions

Summary of Overall GHG Emissions from Project

⁵ Concentration and Size Distribution of Ultrafine Particles near a Major Highway. Journal of the Air and Waste Management Association 52:1032– 1042. Zhu, Y. W. C. Hinds, S. Kim, and C. Sioutas. 2002.

Table 4 presents total GHG emissions for construction activities related to the Project and GHG emissions from the construction of and operation of the resulting residential developments. Details of emissions calculations are included in Appendix A.

Table 4 – Project plus Residential GHG Emissions

Emission Source	Total GHG Emissions (tonnes)			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Grading Off-road Exhaust	117.8	0.0382	N/A	118.8
Grading Employee Exhaust	25.4	0.0003	0.0005	25.6
Residential Construction	290.3	0.0683	N/A	292.0
<i>Amortized* (total/30)</i>				14.5
Residential Operational**	339.8	0.3544	0.0026	349.4
Project + Residential Total (tonnes/year)				363.9

* Pursuant to the South Coast Air Quality Management District's Interim Guidance⁶ construction emissions should be amortized over the life of the project, determined to be 30 years, and added to the operational emissions.

** Operational emissions do not include sequestration emissions calculations, thus potential emissions during operational activity will be lower than presented.

Climate Action Plan (CAP) Checklist

The County recognizes that GHG emissions have the potential to adversely affect the environment because such emissions contribute, on a cumulative basis, to the significant cumulative impact of global climate change and significance determinations should be assessed using cumulative impacts. The County's GHG Significance Guidelines⁷ has reasoned that project specific GHG emissions analyses should be based on consistency with the recently adopted CAP. The Guidelines supply a CAP Consistency Review Checklist (Checklist) as a method to demonstrate consistency with the CAP. A completed Checklist for the Proposed Project is included as Attachment B and is summarized below:

STEP 1: The first step of the Checklist is to evaluate the project's consistency with the growth projections used in the development of the CAP. The County's PDS2005-3100-5431-PDS-PLN-Project Issue Checklist, presents that:

- The General Plan is Semi-Rural General Plan (SR-1), Regional Category Semi-Rural.

⁶ *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans*. South Coast Air Quality Management District. December 5, 2008.

⁷ *Guidelines for Determining Significance: Climate Change*. Land Use and Environment Group Planning & Development Services. County of San Diego. January 2018.

- The project conforms with the density allowed in the General Plan SR-1.

STEP 2: The second step of the CAP consistency review is to review and evaluate a project's consistency with the applicable measures of the CAP. Each checklist item is associated with a specific GHG reduction measure(s) in the County CAP.

- **1a: Project Operations**

Not applicable because the project is a residential only project.

- **2a: Shared and Reduced Parking**

Not applicable because the project is a residential only project.

- **3a: Water Heating Systems**

The applicant will include, as a condition of approval, requirement for the installation of electric or alternatively fueled water heaters. The specific type of water heater is unknown at this time but will be either solar thermal, tankless electric, storage electric, electric heat pump, tankless gas, or some other method acceptable to the County.

- **4a: Water Efficient Appliances and Plumbing Fixtures**

The applicant will include, as a condition of approval, requirement for the installation of

- Kitchen faucets with a maximum flow rate that will not exceed 1.5 gallons per minute (gpm) at 60 pounds per square inch (psi). Temporary increases not to exceed 2.2 gpm are allowed if they default back to the 1.5 gpm.
- At least one qualified ENERGY STAR dishwasher or clothes washer per unit.

- **5a: Rain Barrel Installations**

The applicant will include, as a condition of approval, requirement for the installation of one rain barrel per every 500 square feet of available roof area unless state, regional or local incentives/rebates to purchase rain barrels are not available; or if funding for programs/rebates has been exhausted.

- **6a: Reduce Outdoor Water Use**
The applicant would submit a Landscape Document Package that is compliant with the County's Water Conservation in Landscaping Ordinance (Ordinance Number 10427) and demonstrates a 40% reduction in current Maximum Applied Water Allowance (MAWA) for outdoor use.

- **7a: Agricultural and Farming Equipment**
Not applicable because the project contains no agricultural or farming component.

- **8a: Electric Irrigation Pumps**
Not applicable because the project contains no agricultural or farming component.

- **9a: Tree Planting**
As part of the Stormwater Quality Management Program, at least two trees will be planted per lot, to act as tree wells to mitigate stormwater impacts.

Thank you for the opportunity to provide this analysis. If you have any questions, or if I can be of further assistance, please call me at 760-637-1348.

Sincerely,

OB-1 AIR ANALYSES

A handwritten signature in black ink, appearing to read "Joe O'Bannon", written over a light gray rectangular background.

Joe O'Bannon, Principal

Acronyms and Abbreviations

AB-32	California Global Warming Solutions Act of 2006
AP-42	Compilation of Air Pollutant Emission Factors
CalEEMod™	California Emissions Estimator Model
CAP	Climate Action Plan
CH ₄	methane
Checklist	CAP Consistency Review Checklist
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
County	San Diego County
DPM	diesel particulate matter
GHG	greenhouse gas
gpm	gallons per minute
GWP	global warming potential
MAWA	Maximum Applied Water Allowance
MEI	Maximally Exposed Individual
N ₂ O	nitrous oxide
NO _x	nitrogen oxides
OB-1	OB-1 Air Analyses
PM ₁₀	respirable particulate matter of 10 micrometers or less in size
PM _{2.5}	fine particulate matter of 2.5 micrometers or less in size
ppd	pounds per day
Project	Alpine 21 Project
psi	pounds per square inch
SDAPCD	San Diego Air Pollution Control District
SFR	single family residential
tonne	metric ton
TSP	total suspended particulates
TAC	toxic air contaminants
VMT	vehicle miles traveled
VOC	volatile organic compounds
yd ³	cubic yards