



May 2, 2019

Mr. Dan Bott
 Director, CEQA/NEPA
 VCS Environmental, Inc.
 30900 Rancho Viejo Road, Suite 100
 San Juan Capistrano, CA 92675

SUBJECT: Energy Calculations for Mines Avenue Bikeway Improvement Project

Dear Mr. Bott;

Birdseye Planning Group (BPG) has prepared the energy consumption calculations for the above referenced project. The following tables show estimated gasoline demand for construction workers (Table 1), diesel fuel demand for hauling trips (Table 2) and construction equipment (Table 3). Data provided show energy demand for one, 1,000-foot segment as well as the project total for construction of ten, 1,000-foot segments along Mines Avenue and two, 1,000-foot segments along Dunlap Crossing Road or 12 total 1,000-foot segments. Based on the scope of the proposed project, there would be no direct energy demand (i.e., electricity and natural gas) or fuel demand associated with operation of the project.

All calculations are based on the total Carbon Dioxide Equivalent (CO₂e) value calculated for each construction phase and trip type using the California Emission Estimator Model (CalEEMod) version 2016.3.2. Data are reported in metric tons of CO₂e for the duration of construction. Metric tons are converted to kilogram CO₂e and then divided by a conversion factor used by the U.S. Environmental Protection Agency to estimate gallons of gasoline and diesel fuel consumed based on carbon emissions.

Table 1 - Construction Worker Gasoline Demand

Phase	Days	CO ₂ E MT	Kg CO ₂ e	Kg/CO ₂ /Gallon	Gallons
Site Preparation	6	0.6	600	8.87	68
Paving	2	0.15	150	8.87	17
Arch. Coating	1	0.1	100	8.87	11
Total per segment					96
Total for 12 segments					1,152

Table 2 - Construction Haul Diesel Fuel Demand

Phase	Days	CO ₂ E MT	Kg CO ₂ e	Kg/CO ₂ /Gallon	Gallons
Site Preparation	6	14.7	14,700	10.18	1,444
Paving	2	0.9	900	10.18	88
Arch. Coating	1	0	0	10.18	0
Total per segment					1,532

Mr. Dan Bott
VCS Environmental, Inc.
May 1, 2019
Page 2

Total for 12 segments					18,384
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Table 3 - Construction Equipment Diesel Fuel Demand

Phase	Days	CO2E MT	Kg CO2e	Kg/CO2/Gallon	Gallons
Site Preparation	6	8.5	8,500	10.18	835
Paving	2	1.2	1,200	10.18	118
Arch. Coating	1	0.6	600	10.18	59
Total per segment					1,011
Total for 12 segments					12,132

Please let me know if you have questions regarding the calculations. You can reach me at 760-712-2199 or via e-mail at ryan@birdseyeplanninggroup.com.

Regards,



Ryan Birdseye, Principal