Exhibit C

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Mr. Ahmad Ghaderi
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Sent via email: ahmadg@asengineer.com

Subject: **Focused Air Quality Analysis for the 5005 Long Beach Boulevard Project**

Dear Mr. Ghaderi:

Rincon has prepared this Focused Air Quality Analysis for the 5005 Long Beach Boulevard Project (project) in the City of Long Beach (City), California. This analysis focuses on the pollutant emissions from vehicles using and queuing for the project's car wash and the effects on regional and local air quality.

Project Description

The project site is located at 5005 Long Beach Boulevard in the City of Long Beach, near the Long Beach Boulevard and Del Amo Boulevard intersection. The project includes a Conditional Use Permit to add a 2,100 square-foot car wash and 11 vacuum parking spaces to an existing food mart and gas station. The express car wash uses a conveyer system to move multiple vehicles at once. The queue line for the car wash would be able to handle eight vehicles.

Background

Local Climate and Meteorology

The project site is in the South Coast Air Basin (SCAB), which is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The SCAB includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area in Riverside County. The regional climate in the SCAB is semi-arid and is characterized by warm summers, mild winters, infrequent seasonal rainfall, moderate daytime onshore breezes, and moderate humidity. Air quality in the SCAB is primarily influenced by meteorology and a wide range of emission sources, such as dense population centers, substantial vehicular traffic, and industry. The predominant wind direction in the vicinity of project site is from the northwest and the average wind speed is approximately six miles per hour (Iowa Environmental Mesonet 2019). Mobile sources refer to emissions from motor vehicles, including tailpipe and evaporative emissions, and are classified as either on-road or off-road. On-road sources may be legally operated on roadways and highways. Off-road sources include aircraft, ships, trains, and self-propelled construction equipment.

Criteria Pollutants

Characteristics of ozone, CO, NO_2, and PM are described below.

Ozone

Ozone is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NO_X) and reactive organic gases[1] (ROG). NO_X are formed during the combustion of fuels, while ROG are formed during combustion and evaporation of organic solvents. Because ozone requires sunlight to form, it usually occurs in substantial concentrations between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans including respiratory and eye irritation and possible changes in lung functions. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

Carbon Monoxide

CO is a local pollutant produced in the incomplete combustion of carbon-containing fuels, such as gasoline, natural gas, oil, coal, and wood. The primary source of CO, a colorless, odorless, poisonous gas, is automobile traffic. Therefore, elevated concentrations are usually found near areas of high traffic volumes. The health effects from CO are related to its affinity for hemoglobin in the blood. At high concentrations, CO reduces the amount of oxygen in the blood, causing heart difficulty in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

Nitrogen Dioxide

NO_2 is a byproduct of fuel combustion, with the primary sources being motor vehicles and industrial boilers and furnaces. The principal form of nitrogen dioxide produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. NO_2 is an acute irritant. A relationship between NO_2 and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. NO_2 absorbs blue light, gives a reddish-brown cast to the atmosphere, and reduces visibility. It can also contribute to the formation of ozone/smog and acid rain.

Suspended Particulates

Atmospheric particulate matter is comprised of finely divided solids and liquids such as dust, soot, aerosols, fumes, and mists. The particulates that are of concern include PM_{10} (small particulate matter which measures no more than 10 microns in diameter) and $PM_{2.5}$ (fine particulate matter which measures no more than 2.5 microns in diameter). The characteristics, sources, and potential health effects associated with PM_{10} and $PM_{2.5}$ can be different. Major man-made sources of PM_{10} are agricultural operations, industrial processes, combustion of fossil fuels, construction, demolition operations, and entrainment of road dust into the atmosphere. Natural sources include windblown dust,

[1] CARB defines VOC and ROG similarly as, "any compound of carbon excluding CO, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate," with the exception that VOC are compounds that participate in atmospheric photochemical reactions (CARB 2009). For the purposes of this analysis, ROG and VOC are considered comparable in terms of mass emissions and the term ROG is used in this report. SCAQMD uses the term VOC to denote organic precursors.

wildfire smoke, and sea spray salt. The finer $PM_{2.5}$ particulates are generally associated with combustion processes as well as formation in the atmosphere as a secondary pollutant through chemical reactions. $PM_{2.5}$ is more likely to penetrate deeply into the lungs and poses a serious health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the small and fine particulate matter that is inhaled into the lungs remains there, which can cause permanent lung damage. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

Current Air Quality

The SCAQMD operates a network of air quality monitoring stations throughout the SCAB. The purpose of the monitoring stations are to measure ambient concentrations of pollutants and determine whether ambient air quality meets the California and national standards. The monitoring station for 8-hour and 1-hour ozone, PM_{10}, and NO_2 closest to the project is the Long Beach-2425 Webster Street monitoring station, approximately 3.5 miles southwest of the project site. The closest station for $PM_{2.5}$ is the Compton-700 North Bullis Road, located approximately 3.7 miles northwest of the project site. Table 1 indicates the number of days that each of the national and state standards have been exceeded at these stations in each of the last three years for which data is available. The only pollutant that exceeded standards is PM_{10}.

Table 1 Ambient Air Quality

Pollutant	2016	2017	2018
Ozone (ppm), maximum concentration 8-hours	0.059	0.068	0.063
Number of days of state and federal exceedances (>0.070 ppm)	0	0	0
Ozone (ppm), maximum concentration 1-hour	0.079	0.082	0.074
Number of days of state exceedances (>0.09 ppm)	0	0	0
Nitrogen Dioxide (ppm), maximum concentration 1-hour	75.6	89.5	85.3
Number of days of state exceedances (>0.18 ppm)	0	0	0
Particulate Matter <10 microns ($\mu g/m^3$), maximum concentration 24-hours	75.0	79.0	83.0
Number of days of state exceedances (>50 $\mu g/m^3$)	8	10	4
Number of days of federal exceedances (>150 $\mu g/m^3$)	0	0	0
Particulate Matter <2.5 microns (mg/m^3), maximum concentration 24-hours	36.3	66.7	49.4

Source: CARB 2020

Sensitive Receptors

CARB and the Office of Environmental Health Hazard Assessment (OEHHA) have identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, infants (including in utero in the third trimester of pregnancy), and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis (CARB 2005, OEHHA 2015). Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved and are referred to as sensitive receptors. Examples of these sensitive receptors are residences, schools, hospitals, religious facilities, and daycare centers. The closest sensitive receptor to the project site is Dooley Elementary School, located adjacent to the north of the site.

Air Quality Regulations

Federal Air Quality Regulations

The federal Clean Air Act (CAA) was enacted in 1970 and amended in 1977 and 1990 [42 United States Code (USC) 7401] for the purposes of protecting and enhancing the quality of the nation's air resources to benefit public health, welfare, and productivity. In 1971, to achieve the purposes of Section 109 of the CAA [42 USC 7409], the United States Environmental Protection Agency (U.S. EPA) developed primary and secondary National Ambient Air Quality Standards (NAAQS). NAAQS have been designated for the following criteria pollutants of primary concern: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter with diameters of ten microns or less (PM_{10}) and 2.5 microns ($PM_{2.5}$) or less, and lead (Pb). The primary NAAQS "in the judgment of the Administrator[2], based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health" and the secondary standards are to "protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air" [42 USC 7409(b)(2)]. The U.S. EPA classifies specific geographic areas as either "attainment" or "nonattainment" areas for each pollutant based on the comparison of measured data with the NAAQS. States are required to adopt enforceable plans, known as a State Implementation Plan (SIP), to achieve and maintain air quality meeting the NAAQS. State plans also must control emissions that drift across state lines and harm air quality in downwind states. Table 2 lists the current national standards for regulated pollutants.

[2] The term "Administrator" means the Administrator of the Environmental Protection Agency

Table 2 National and State Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS	CAAQS
Ozone	1-Hour	–	0.09 ppm
	8-Hour	0.070 ppm	0.070 ppm
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	0.053 ppm	0.030 ppm
	1-Hour	0.100 ppm	0.18 ppm
Sulfur Dioxide	Annual	–	–
	24-Hour	–	0.04 ppm
	1-Hour	0.075 ppm	0.25 ppm
PM_{10}	Annual	–	20 µg/m³
	24-Hour	150 µg/m³	50 µg/m³
$PM_{2.5}$	Annual	12 µg/m³	12 µg/m³
	24-Hour	35 µg/m³	–
Lead	30-Day Average	–	1.5 µg/m³
	3-Month Average	0.15 µg/m³	–

ppm = parts per million; NAAQS = National Ambient Air Quality Standards; CAAQS = California Ambient Air Quality Standards
µg/m³ = micrograms per cubic meter
Source: California Air Resource Board 2016

The SCAB is in non-attainment for the national standards for ozone and $PM_{2.5}$. Areas of the SCAB located in Los Angeles County are also in nonattainment for lead (SCAQMD 2016). The SCAB is designated unclassifiable or in attainment for all other national and state standards.

Applicable Thresholds

Regional Significance Thresholds

The SCAQMD recommends the following quantitative regional significance thresholds for long-term project operation in the SCAB (SCAQMD 2019):

- 55 pounds per day of ROG
- 55 pounds per day of NO_X
- 550 pounds per day of CO
- 150 pounds per day of SO_X
- 150 pounds per day of PM_{10}
- 55 pounds per day of $PM_{2.5}$

Localized Significance Thresholds

In addition to the above regional thresholds, the SCAQMD has developed Localized Significance Thresholds (LSTs) in response to the Governing Board's Environmental Justice Enhancement Initiative (1-4), which was prepared to update the *CEQA Air Quality Handbook* (1993). LSTs were devised in response

to concern regarding exposure of individuals to criteria pollutants in local communities and have been developed for NO_X, CO, PM_{10}, and $PM_{2.5}$. LSTs represent the maximum emissions from a project that will not cause or contribute to an air quality exceedance of the most stringent applicable national or state ambient air quality standard at the nearest sensitive receptor, taking into consideration ambient concentrations in each source receptor area (SRA), distance to the sensitive receptor, and project size.

The SCAQMD provides LST lookup tables for project sites that measure one, two, or five acres. Operation of the car wash would occur on an area less than one acre in size; therefore, this analysis utilizes the one-acre LSTs. LSTs are provided for receptors at 82 to 1,640 feet from the project disturbance boundary to the sensitive receptors. Operational activity of the car wash and queue line would occur approximately 25 feet to 100 feet from the school to the north. According to the SCAQMD's publication, *Final LST Methodology*, projects with boundaries located closer than 82 feet to the nearest receptor should use the LSTs for receptors located at 82 feet. Therefore, the analysis below uses the LST values for 82 feet. In addition, the project is in SRA-4 (South Coastal LA County). LSTs for operation in SRA-4 on a 1-acre site with a receptor 82 feet away are shown in Table 3.

Table 3 SCAQMD LSTs for Construction (SRA-4)

Pollutant	Allowable Emissions for a 1-acre Site in SRA 4 for a Receptor 82 Feet Away (lbs/day)
Gradual conversion of NO_X to NO_2	57
CO	585
PM_{10}	4
$PM_{2.5}$	1

Source: SCAQMD 2009

Methodology

Criteria pollutant emissions of CO, PM_{10}, $PM_{2.5}$, SO_2, and the ozone precursors ROG and NO_X, would occur from vehicles using the project site. Emissions from the vehicles of customers who utilize the car wash, including the queue, are running exhaust emissions, which occur as the user slowly moves through the car wash. Running exhaust emissions occur after the engine is warmed up and the emissions control system in the vehicle have reached full operating temperature. As the vehicles would be in operation the entire time while in queue or in the car wash (i.e., no engine start up or shut off), only emissions associated with a running engine are calculated.

Emission factors used to calculate running exhaust emissions were obtained from the California Air Resources Board's (CARB's) EMission FACtor 2017 database software (EMFAC2017). EMFAC2017 produces emissions factors for each mode of engine operations specific to various vehicle classes and emissions control technologies for a range of vehicle speeds, soak times, variable start times, and ambient temperatures. Inputs in EMFAC2017 included calendar year, the air district, vehicle model year, fuel types, and speeds. The flowing parameters were used to develop the emission factors:

Calendar Year: 2020
Air District: SCAQMD
Vehicle Model Years: All years aggregated
Fuel Type: All
Speeds: 5 miles per hour (mph) (the lowest speed available)

The vehicles would be idling for a portion of their time in the queue and while going through the car wash; therefore, idle time emissions for light-duty vehicles is incorporated into the running exhaust emissions by multiplying the emission factors by five per the EMFAC2017 Guidance manual.

The emission factors for the EMFAC2017 vehicle passenger vehicle categories (LDA, LDT1, LDT2, and MDV) were weighted according to the vehicle miles traveled (VMT) for each vehicle category, and after weighting were averaged to obtain one emission factor per pollutant. Emission factors are provided in grams per mile. Although vehicles would only travel approximately 350 feet through the queue and car wash at the project site, the emissions factors used were the most conservative, i.e. all vehicles are modeled at idle for the entire period. Emissions of air quality pollutants in this analysis are compared to the regional thresholds and LSTs.

According to the project applicant, it would take each vehicle approximately five minutes to use the car wash. Since the car wash can move multiple vehicles through at once, according to the project applicant the maximum queuing and carwash process time for a vehicle would be in the range of 6-10 minutes. For the calculations, it was conservatively assumed that each vehicle would be running on site for 10 minutes. It was assumed that the car wash would handle approximately 300 vehicles per day; this number was used as a conservative value for the analysis.

Impact Analysis

Table 4 summarizes the project's vehicle emissions with a 10-minute maximum trip and with 300 vehicles per day through the car wash. As shown below, the emissions generated by operation of the proposed project would be well below the SCAQMD regional thresholds or LSTs for criteria pollutants. Therefore, the project would not contribute substantially to an existing or projected air quality violation, and would not have a substantial localized impact to nearby sensitive receptors (e.g., Dooley Elementary School) from criteria pollutant emissions.

Table 4 Project Operational Emissions

Pollutant	Pounds per Day Per 300 Vehicles	SCAQMD Regional Threshold	SCAQMD Localized Threshold	Exceed Thresholds?
ROG	0.011	55	N/A	No
NO_X	0.013	55	57	No
CO	0.171	550	585	No
SO_X	0.001	150	N/A	No
PM_{10}	0.001	150	4	No
$PM_{2.5}$	0.001	55	1	No

See Methodology for calculation methods. Grams per mile provided by EMFAC2017.

Conclusion

The project was assumed to have up to 300 vehicles use the car wash per day, and the maximum queuing and carwash process time for a vehicle would be in the range of 6-10 minutes. Using EMFAC2017 emission factors, criteria pollutant emissions from these vehicles would be well below the SCAQMD regional thresholds and LSTs for criteria pollutants. Therefore, the project would not exceed any NAAQS or CAAQS, result in an adverse effect on regional air quality, or result in an unhealthy concentration of criteria pollutants at a local sensitive receptor from the project's air quality emissions associated with vehicles using the carwash.

Sincerely,

Rincon Consultants, Inc.

Bill Vosti
Senior Environmental Planner

William A. Maddux
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References

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