Neighborhood House Association

5660 Copley Drive
San Diego, CA 92111

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Air Quality Technical Report

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Table of Contents

Table of Appendices

List of Tables

Air Quality Technical Report

1.0 INTRODUCTION

1.1 Purpose

Yorke Engineering, LLC (Yorke) is pleased to provide this Air Quality Technical Report, which includes emissions estimates and criteria pollutant analysis for the proposed child care center located at 4110 41st Street in San Diego, CA. These evaluations will support a Categorical Exemption or a Mitigated Negative Declaration (MND) from the City under the California Environmental Quality Act (CEQA).

1.2 Project Description

The project site is located within the jurisdiction of the San Diego Air Pollution Control District (SDAPCD or District) and, for CEQA relevance, the City of San Diego (City). The proposed project involves the construction of a single-story, 3,480-square-foot childhood educational facility with a small playground area located at 4110 41st Street in San Diego, CA. The 0.35-acre parcel is currently unoccupied and consists of an unpaved vacant lot. Therefore, there will be no demolition of old buildings involved in this project. Minimal site preparation and grading will be required. A total of 14 parking spaces will be provided for employee and customer use.

2.0 REGIONAL AND LOCAL AIR QUALITY SETTING

Air quality in the San Diego Air Basin (SDAB), which has the same boundaries as the San Diego region, is affected by the rate and location of pollutant emissions under the influence of meteorological and climatic conditions and topographic features. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients, along with local topography, influence the movement and dispersal of pollutants. Air quality in the San Diego region is measured by 12 strategically located ambient air monitoring stations operated by the SDAPCD. These stations measure ambient concentrations of criteria air pollutants, as well as meteorological parameters, including wind speed, wind direction, ambient temperature, and cloud cover. A detailed discussion of regional topography, climate, meteorology, and ambient air quality prepared by the San Diego Association of Governments is incorporated by reference as Attachment 2 (SANDAG 2015).

3.0 POLLUTANTS AND EFFECTS

So-called “criteria” air pollutant concentrations are used to determine compliance with National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) established under the federal Clean Air Act and California Clean Air Act, respectively. Areas with levels that violate the standard for specified pollutants are designated as non-attainment areas. NAAQS have been established for seven pollutants: ozone (O3), carbon monoxide (CO), nitrogen dioxide (NO2), sulfur dioxide (SO2), respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less (PM10), fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less (PM2.5), and lead (Pb). These pollutants are also covered by the CAAQS, which are more stringent than the NAAQS. The CAAQS also cover sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles.

The use of diesel-powered construction equipment emits ozone precursors oxides of nitrogen (NOx) and reactive organic gases (ROG), and diesel particulate matter (DPM), the latter being a composite of toxic air contaminants (TACs) containing a variety of hazardous substances. Large construction projects using multiple large earthmoving equipment are evaluated to determine if operations may exceed the District's daily threshold for NOx emissions and could temporarily expose area residents to hazardous levels of DPM.

4.0 REGULATORY APPLICABILITY

Per the following SDAPCD Rule 2 definitions, the proposed project does not meet the regulatory definition of a stationary source of air contaminants because it contains no non-exempt sources, therefore, no federal, state, or local regulations directly govern the project site.

- Paragraph 47 defines "Stationary Source" or "Source" as an emission unit or aggregation of emission units which are located on the same or contiguous properties and which units are under common ownership or entitlement to use. Stationary sources also include those emission units or aggregation of emission units located in the California Coastal Waters.
- Paragraph 20 defines an "Emission Unit" as any [Rule 11 non-exempt] article, machine, equipment, contrivance, process, or process line which emit(s) or reduce(s), or may emit or reduce, the emissions of any air contaminant, except motor vehicles.
- Paragraph 3 defines "Air Contaminant" or "Air Pollutant" as any substance discharged, released, or otherwise propagated into the atmosphere and including, but is not limited to, any of the following: volatile organic compounds, exempt compounds, oxides of nitrogen, particulate matter, gaseous sulfur compounds, carbon monoxide, toxic air contaminants, smoke, dust, soot, carbon, noxious acids and gases, fumes, odors, or any combination thereof.

5.0 THRESHOLDS OF SIGNIFICANCE

Quantitative significance criteria established by the SDAPCD were used to make significance determinations based on mass emissions of criteria pollutants and GHGs, as determined in this report. These are summarized below.

Table 4-1: SDAPCD CEQA Thresholds of Significance

Pollutant	Project Construction	Project Operation
	lbs/day	lbs/day
ROG (VOC)	137	137
NO_x	250	250
CO	550	550
SO_x	250	250
PM_{10}	100	100
$PM_{2.5}$	–	–

Source: City of San Diego 2016

6.0 AIR EMISSIONS QUANTIFICATION METHODOLGY

The construction and operation analysis were performed using CalEEMod, version 2016.3.2, the official statewide land use computer model designed to provide a uniform platform for estimating potential criteria pollutant and GHG emissions associated with both construction and operations of land use projects under CEQA. The model quantifies direct emissions from construction and operations (including vehicle use), as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. The mobile source emission factors used in the model – published by the California Air Resources Board (CARB) – include the Pavley standards and Low Carbon Fuel standards. The model also identifies project design features, regulatory measures, and best management practices to reduce criteria pollutant and GHG emissions along with calculating the benefits achieved from the selected measures. CalEEMod was developed by the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the SCAQMD, the Bay Area Air Quality Management District (BAAQMD), the San Joaquin Valley Air Pollution Control District (SJVAPCD), and other California air districts. Default land use data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) were provided by the various California air districts to account for local requirements and conditions. As the official assessment methodology for land use projects in California, CalEEMod is relied upon herein for construction and operational emissions quantification, which forms the basis for the impact analysis.

Based on information received from the Applicant, and information collected on Google Earth, land use data used for CalEEMod input is presented in Table 1. The SDAPCD quantitative significance thresholds shown in Table 2 were used to evaluate project emissions impacts (City of San Diego 2016).

Table 6-1: Land Use Data for CalEEMod Input – 4110 41st Street, San Diego, CA

Project Element	Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage (footprint)	Square Feet (est.)
Child Care Center	Educational	Day Care Center	3.48	1,000 sq. ft.	0.080	3,480
Parking Lot	Parking	Parking Lot	4.25	1,000 sq. ft.	0.098	4,250
Concrete Paving and Landscaping	Parking	Other Non-Asphalt Surfaces	7.47	1,000 sq. ft.	0.171	7,470
Project Site					**0.349**	**15,200**

Source: Applicant 2019, CalEEMod version 2016.3.2

The following basic assumptions were used in developing the emission estimates for the proposed project using the California Emissions Estimator Model® (CalEEMod):

- Some project design features including size of some building features were defined by the Applicant.
- Some Project design features such as building size, pavements size, and parking lot sizes were determined using Google Earth measurement tools or approximated using the architect's drawings.

- Default construction equipment horsepower ratings and load factors contained in CalEEMod were applied to all phases of the project.
- Construction site watering for fugitive dust control was set to three times daily. Street sweeping around the construction site was assumed to control track-out dust. These measures substantially reduce fugitive dust impacts.
- Per the CalEEMod User's Guide, Vendor Trips Number was increased to account for cement trucks. This is because CalEEMod does not include cement trucks for paving with cement in the land use sub-type of Other Non-Asphalt Surfaces.
- Consumer product usage as applicable to land use.
- Energy efficiency and water conservation measures generally required by codes are implemented.
- The parking was assumed to be unenclosed, outdoor parking.
- It was assumed that building coatings (e.g. primer, paint, window coatings etc.) will be applied over no less than 5 days. Since the building consists of pre-fabricated units, it was assumed that only minimal touch up is required for exterior architectural coatings.
- There is no earthen material being imported or exported from the project site, which is generally flat.
- The Default equipment from CalEEMod for each construction phase, is representative of actual construction equipment used during construction.

7.0 AIR QUALITY IMPACTS ANALYSIS

The Air Quality Section of Appendix G of the California Environmental Quality Act (CEQA) Guidelines (Environmental Checklist Form) contains air quality and GHG significance criteria.

7.1 Construction Impacts

A project's construction phase produces many types of emissions, but PM_{10} (including $PM_{2.5}$) in fugitive dust and diesel engine exhaust are the pollutants of greatest concern. Fugitive dust emissions can result from a variety of construction activities, including excavation, grading, demolition, vehicle travel on paved and unpaved surfaces, and vehicle exhaust. Construction-related emissions can cause substantial increases in localized concentrations of PM_{10}, as well as affecting PM_{10} compliance with ambient air quality standards on a regional basis. Particulate emissions from construction activities can lead to adverse health effects as well as nuisance concerns such as reduced visibility and soiling of exposed surfaces.

The SDAPCD's approach to CEQA analyses of fugitive dust impacts is to require implementation of effective and comprehensive dust control measures rather than to require detailed quantification of emissions. PM_{10} emitted during construction can vary greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, weather conditions, and other factors, making quantification difficult. Despite this variability in emissions, experience has shown that there are several feasible control measures that can be reasonably implemented to significantly reduce fugitive dust emissions from construction. For larger projects, the SDAPCD has determined that compliance with an approved fugitive dust control plan comprising Best Management Practices (BMPs), primarily through frequent water application, constitutes

sufficient best management practices to reduce PM_{10} impacts to a level considered less than significant.

The use of diesel-powered construction equipment emits ozone precursors oxides of nitrogen (NO_x) and reactive organic gases (ROG), and diesel particulate matter (DPM), the latter being a composite of toxic air contaminants (TACs) containing a variety of hazardous substances. Large construction projects using multiple large earthmoving equipment are evaluated to determine if operations may exceed the District's daily threshold for NO_x emissions and could temporarily expose area residents to hazardous levels of DPM. Use of architectural coatings and other materials associated with finishing buildings may also emit ROG and TACs.

Table 7-1 shows unmitigated and mitigated criteria construction emissions and compares mitigated emissions to SDAPCD significance thresholds. CalEEMod output files are in Appendix A.

Table 7-1: Construction Emissions Summary and Significance Evaluation

Criteria Pollutants	Unmitigated	Threshold	Significance
	lbs/day	lbs/day	
ROG (VOC)	14.4	137	LTS
NO_x	11.2	250	LTS
CO	9.9	550	LTS
SO_x	0.0	250	LTS
Total PM_{10}	1.5	100	LTS
Total $PM_{2.5}$	0.9	–	LTS

Sources: City of San Diego 2016, CalEEMod version 2016.3.2

Notes:

lbs/day are winter or summer maxima for planned land use

Total PM_{10}/$PM_{2.5}$ comprises fugitive dust plus engine exhaust

LTS – Less Than Significant

7.2 Operational Impacts

The term "project operations" refers to the full range of activities that can or may generate criteria pollutant, GHG, and TAC emissions when the project is functioning in its intended use. For projects, such as office parks, shopping centers, apartment buildings, residential subdivisions, and other indirect sources, motor vehicles traveling to and from the project represents the primary source of air pollutant emissions. For industrial projects and some commercial projects, equipment operation and manufacturing processes, i.e., permitted stationary sources, can be of greatest concern from an emissions standpoint. CEQA significance thresholds address the impacts of operational emission sources on local and regional air quality. Thresholds are also provided for other potential impacts related to project operations, such as odors.

Table 7-4 shows unmitigated and mitigated criteria operational emissions and compares mitigated emissions to SDAPCD significance thresholds. CalEEMod output files are in Appendix A.

Table 7-2: Operational Emissions Summary and Significance Evaluation

Criteria Pollutants	Unmitigated lbs/day	Threshold lbs/day	Significance
ROG (VOC)	0.5	137	LTS
NO_x	1.3	250	LTS
CO	3.2	550	LTS
SO_x	0.0	250	LTS
Total PM_{10}	0.7	100	LTS
Total $PM_{2.5}$	0.2	–	LTS

Sources: City of San Diego 2016, CalEEMod version 2016.3.2

Notes:

Winter or summer maxima for planned land use; Total PM_{10}/$PM_{2.5}$ includes fugitive dust plus engine exhaust

LTS – Less Than Significant

7.3 Toxic Air Contaminants

The City Development Services Department (Lead Agency) requested a health risk analysis to address potential exposures of sensitive receptors to potentially substantial pollutant concentrations, including toxic air contaminants (TACs), due to the proposed facility's proximity to Interstate 15 (I-15). The City is requiring the Project to prepare an Air Quality Technical Study to provide an analysis of potential impacts that granting this CUP would have on the students and faculty at the school due to truck emissions of DPM emanating from I-15. This evaluation is in support of the environmental assessment for the Conditional Use Permit (CUP) for the operation of the proposed Project as requested by the City of San Diego (the City). The Mobile Source HRA was conducted to evaluate exposures of sensitive receptors (students) and workers (faculty/staff) to potentially substantial pollutant concentrations including air toxics such as diesel particulate matter (DPM) in accordance with the City's California Environmental Quality Act (CEQA) guidelines (City 2016). The mobile source HRA evaluated onroad heavy-heavy-duty (HHD) and medium-heavy duty (MHD) truck traffic and does not address cumulative impacts (risks) from other sources near the proposed project, whether stationary or mobile. Also, the scope of the mobile source HRA does not consider any mitigation measures that may be implemented to reduce exposures. The mobile source HRA is provided in Appendix B.

8.0 CONCLUSION

As shown in Section 7, unmitigated construction and operational emissions are all below SDAPCD CEQA mass emissions significance thresholds. In addition, health risk impacts were estimated to be well below the maximum cancer risk and non-cancer Chronic Hazard Index (HIC) for sensitive (student) and worker receptors compared to SDAPCD thresholds. The CalEEMod output files are provided in Appendix A. The mobile source HRA is provided in Appendix B. Therefore, the following air quality and health risk significance determinations for the project may be made:

PROJECTED IMPACT: Less Than Significant

ADDITIONAL MITIGATION: None required

9.0 REFERENCES

California Air Resources Board (CARB). 2008. Climate Change Scoping Plan. Website (http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm) accessed March 18, 2019.

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California Energy Commission (CEC). 2017. Building Energy Efficiency Program. Website (http://www.energy.ca.gov/title24/) accessed March 18, 2019.

City of San Diego (City). 2016. CEQA Significance Determination on Thresholds. Website (https://www.sandiego.gov/sites/default/files/july_2016_ceqa_thresholds_final_0.pdf) accessed July 10, 2019.

San Diego Association of Governments (SANDAG). 2015. Final Environmental Impact Report San Diego Forward: The Regional Plan; Section 4.3 – Air Quality. State Clearinghouse No. 2010041061. October 2015. Website (https://www.sdforward.com/envimpactreport) accessed July 10, 2019.

APPENDIX A – CALEEMOD OUTPUTS

APPENDIX B – MOBILE SOURCE HEALTH RISK ASSESSMENT