DOCKETED	
Docket Number:	24-OPT-02
Project Title:	Compass Energy Storage Project
TN #:	262093
Document Title:	REV 2 DR AQ-GHG-PH Response
Description:	N/A
Filer:	Erin Phillips
Organization:	Dudek
Submitter Role:	Applicant Consultant
Submission Date:	3/5/2025 10:32:54 AM
Docketed Date:	3/5/2025

MEMORANDUM

To:	California Energy Commission
From:	Compass Energy Storage LLC
Subject:	Response to Data Request REV 2 DR Air Quality/Greenhouse Gas Emissions/Public Health
Date:	March 5, 2025
Attachment(s):	Revised Application Section 4.1, Air Quality

On February 3, 2025, Compass Energy Storage LLC and Affiliates (Applicant) received an air quality (AQ)/greenhouse gas (GHG)/public health (PH) data request from the California Energy Commission (CEC) for the Compass Battery Energy Storage Project (project; Docket Number 24-OPT-02) in response to the most recent set of data responses (Data Request Response #4). The AQ/GHG/PH data request is as follows:

1.1 REV 2 DR AQ-1

Air Quality:

The applicant revised the construction emissions in Data Request Response 4 (TN 260328), which would be higher than those estimated previously. Staff requires updated ambient air quality impacts modeling results using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) as required by Appendix B (g) (8) (I) (i).

REV 2 DR AQ-1. *Please provide the updated AERMOD results for the following air pollutants: nitrogen dioxide (NO2), carbon monoxide (CO), sulfur dioxide (SO2), particulate matter of 10 micrometers or less in diameter (PM10), and particulate matter of 2.5 micrometers or less in diameter (PM2.5).*

The Applicant provides the following response to REV 2 DR AQ-1:

The overwhelming majority (99.98%) of the reported increase in criteria air pollutant emissions related to the November 2024 update come from increases in offsite vehicle trip distances for workers/vendor/haul trucks during construction based on updated trip length information. The Health Risk Assessment (HRA) and Ambient Air Quality Analysis (AAQA) analyses already include the “on-site” or near-by portion of these trips (within 0.25 miles). There was a very small increase related to daily haul trucks for the delivery of the battery energy storage system (BESS) units but that increase represents a 0.02% increase in the on-site emissions from the project. As shown in the Revised Air Quality Section 4.1, Table 4.1-5, Estimated Maximum Daily Construction Criteria Air Pollutant Emissions, the project’s construction emissions for all criteria air pollutants (VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$) are well below South Coast Air Quality Management District (SCAQMD) significance thresholds. Given the very small magnitude of this increase in emissions, any increase in either the HRA or AAQA results would be negligible and short-term construction impacts would remain less than significant. Therefore, we don’t believe that an updated HRA or AAQA would be warranted.

1.2 REV 2 DR AQ-2

REV 2 DR AQ-2. *Please demonstrate compliance with the new annual PM2.5 National Ambient Air Quality Standard (NAAQS) of 9.0 µg/m³ or show that the project's impact would be below the new Significant Impact Level (SIL) of 0.13 µg/m³.*

The Applicant provides the following response to REV 2 DR AQ-2:

Please see the attached Revised Air Quality Section 4.1. Table 4.1-14 and Table 4.1-15 have been updated in strikeout/underline to reflect the new $PM_{2.5}$ NAAQS of 9.0 *µg/m³* and the new significant impact level of 0.13 *µg/m³*. The $PM_{2.5}$ concentration would be below the new Significant Impact Level of 0.13 *µg/m³*. Therefore, impacts would remain less than significant when applying the new threshold.

1.3 REV 2 DR AQ-3

Staff's draft Condition of Certification (COC) ***TRANS-1*** *would require the applicant to prepare and implement a Construction Management Plan (CMP), which would include a provision to prohibit truck trips from leaving the site during the hours of 7:00-9:00 AM and 2:00-4:00 PM to avoid the peak times when students are arriving/departing J Serra High School. The configuration of the Camino Capistrano/Rancho Capistrano intersection is such that all vehicles need to turn right (southbound), which necessitates them passing the high school. The application states that air dispersion modeling assumed emissions would occur 8 hours per day, 5 days per week. Staff needs to understand how the traffic prohibition would affect the onsite criteria air pollutant emissions and associated impacts.*

In addition, in the applicant's air dispersion modeling, only vehicle trips within 0.25 miles of the project site were accounted for and modeled. Staff requires an updated air dispersion modeling of the impacts due to vehicles passing the high school and nearby sensitive receptors as required by Appendix B (g) (8) (I) (i).

REV 2 DR AQ-3. *Please update the onsite criteria air pollutant emissions estimation and ambient air quality analysis according to the truck trip prohibition in staff's draft COC* ***TRANS-1*** *or justify why an updated analysis is not needed.*

The Applicant provides the following response to REV 2 DR AQ-3:

The Applicant expects to prepare and implement a Construction Management Plan (CMP) for the project to ensure proper traffic control and safety, however, prohibiting truck trips between 7:00 a.m. and 9:00 a.m. and 2:00 p.m. and 4:00 pm as proposed in draft COC TRANS-1 would not meaningfully reduce criteria air pollutant concentrations at the high school or other sensitive receptors more than 0.25 miles from the site, but it would result in a marginal increase in the hourly concentration of criteria air pollutants by requiring the same number of truck trips to occur in a shorter time period each day. It should be noted that the City of San Juan Capistrano already limits construction hours to between 7:00 a.m. and 6:00 p. m (an 11-hour window) and therefore the possible condition would further compress construction to 7 hours rather than the 8-hour workday assumed in the project emissions modeling. This could result in more trucks in a shorter time, which would potentially increase the emissions concentration results in the AAQA analysis as dicussed below.

The AAQA evaluates criteria air pollutant emission concentrations at several different averaging times depending on the pollutant. Only NO_2, CO and SO_2 have ambient air standards that are less than 24 hours and therefore are the only pollutants in the AAQA that would see an increase in their concentrations relative to the CAAQS or NAAQS from implementation of COC TRANS-1. However, as shown in Section 4.1, Table 4.1.15, only NO_2 is near either the NAAQs or CAAQS for the 1-hour averaging time. NO_x emissions from heavy-duty trucks are 2.2% of the total daily NO_x emissions during construction. The increase in concentration of these pollutants from limiting the available time from 8 hours to 7 hours would result in a 0.31% increase in peak hourly NO_x concentrations during construction. As shown in Table 4.1.15, peak hourly NO_2 concentrations from the project were 80.03 $\mu g/m^3$, and the 0.31% increase would result in an increase to 80.28 $\mu g/m^3$. When added to the background concentration of 95.94 $\mu g/m^3$ the total concentration would be 176.22 $\mu g/m^3$ which would still be below the NO_2 hourly CAAQS of 339 $\mu g/m^3$ and the NAAQS of 188 $\mu g/m^3$. Therefore, the ambient air concentration would not exceed the established state and federal standards that are in place to protect public health. Given the relatively small increase in concentration of NO_2 and that the NO_2 concentration would still be below the CAAQS and NAAQS, additional modelling is not needed to demonstrate that project impacts would remain less than significant if COC TRANS-1 were implemented. Please refer to the attached Section 4.1 for additional detail.

In addition, it should be noted that the J Serra High School is located 250 feet from Interstate (I-) 5, where an average of 10,766 trucks pass by the high school on I-5 everyday (CalTrans Traffic Census Program, https://dot.ca.gov/programs/traffic-operations/census).

1.4 REV 2 DR AQ-4

REV 2 DR AQ-4. *Please provide offsite criteria air pollutant emissions estimation and ambient air quality analysis of the vehicles passing the high school and nearby sensitive receptors.*

The Applicant provides the following response to REV 2 DR AQ-4:

To clarify, all trips related to the project are captured in the analysis but only 0.25 miles of each trip are included in the air dispersion modeling for the AAQA and HRAs – in order to capture vehicles emissions as they pass the project site and to capture vehicle emission to the nearest receptors to the project site per air district guidance. The additional emissions analysis is not needed near the school for the following reasons:

The heavy-duty truck trips from the project would only pass by the high school for a momentary duration where emissions would disperse rapidly compared to onsite construction equipment. Because of this short time frame, modeling the truck trips next to the high school would not change the results of the most impacted receptors. As noted above, this is in the context of a baseline where the J Serra High School is located 250 feet from I-5, where an average 10,766 trucks pass by the high school on I-5 everyday (CalTrans Traffic Census Program, https://dot.ca.gov/programs/traffic-operations/census). A qualitative discussion of why air quality and public health impacts related to the pass-by of trucks from this project near the school would be nominal is included below as an alternative approach to providing additional dispersion modeling.

- The total time diesel trucks would be passing by the school represent a very small fraction of the total length of construction and the Office of Environmental Health Hazard Assessment has not identified an acute reference exposure level for diesel particulate matter (DPM). Therefore, there is no acute health risk associated with DPM. The health risk associated with DPM is from long term repeated exposure over an extended time period – such as the course of the entire construction period.

- The school is approximately 250 feet west of the I-5 Freeway where an average 10,766 trucks pass by the high school on I-5 every day. This is a much larger source of criteria air pollutant and DPM emissions on an ongoing basis. The additional trips associated with the project during a few months of the construction would be de minimis relative to the baseline emissions.

- The school in question is approximately 0.8 miles away from the southeast boundary of the project site, while the predominant wind direction is from the southwest. Therefore, the emissions related to onsite construction (which account of the vast majority of project construction emissions) would minimally compound with the emissions from trucks passing-by the school and to a lesser degree than to sensitive receptors closer to the site.

- The criteria air pollutant emissions resulting from the trucks passing the school (approximately 0.33 miles of adjacent roadway travel) would represent a small fraction (less than 0.02%) of the total emissions from the project construction. There is no basis to conclude that offsite emissions from certain trucks during a short period of time would rise to an exposure level of significance.

- For the HRA, the closest and most sensitive receptors are nearby residences. The HRA determined that the health risk at the sensitive receptors closest to the project site that would have the highest exposure to DPM would be below the SCAQMD's threshold of significance. Therefore, it is not anticipated that the receptors farther away (J Serra High School) from the project site would see a higher health risk exposure.

Given these factors, there is no need for additional modeling to demonstrate that the criteria air pollutant emissions and health effects associated with heavy duty trucks passing by the school would be less than those at the main project site, would not increase exposure at this level beyond the existing baseline near I-5, and would be less than significant.

1.5 REV 2 DR GHG-1

Greenhouse Gas Emissions:

The Project Description section of the application states that the battery energy storage system (BESS) would be equipped with air conditioning, but the refrigerant is not specified. There are no calculations of refrigerant usage/leakage or the contribution to greenhouse gas (GHG) emissions. The project also needs to comply with the regulation Prohibitions on Use of Certain Hydrofluorocarbons (HFCs) in Stationary Refrigeration, Stationary Air-conditioning and Other End-Uses (California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4) as required by Appendix B (g) (1).

REV 2 DR GHG-1 *Please identify the refrigerant to be used in the BESS air conditioning systems and demonstrate that the proposed refrigerant would comply with the HFC prohibition regulation.*

The Applicant provides the following response to REV 2 DR GHG-1:

The Project Description section of the application states that the BESS contains a heating, ventilation, and air conditioning (HVAC) system. However, subsequent revisions to the Project application have removed reference to an HVAC system because this is not an accurate description of the cooling system.

The BESS includes a thermal management system (TMS), which provides a suitable operating temperature for the MP2XL units by using liquid cooling via a 50/50 mixture of ethylene glycol and water, and R-134a refrigerant. The TMS is a closed-loop liquid cooling system that circulates liquid coolant throughout the battery modules and power electronics to maintain an optimum operating temperature. The TMS works autonomously and does not require user feedback or controls to turn the system on when needed or to adjust temperature settings. The thermal roof, located above the battery bays within an IP20 enclosure, provides a ventilation airspace and contains fans and radiators that cool the ethylene glycol-water solution. The liquid cooling system utilizes approximately 380 liters (100 gallons) of the ethylene glycol-water solution, and the vapor compression portion of the cooling cycle utilizes 1.5 kilograms (3.3 pounds) of R-134a refrigerant. The R-134a refrigerant is a gas at atmospheric pressure, but the MP2XL does not condition air as all components in the liquid thermal management system use the coolant specifically as a working fluid.

The California Air Resources Board (CARB) regulation *Prohibitions on Use of Certain Hydrofluorocarbons (HFCs) in Stationary Refrigeration, Stationary Air-conditioning and Other End-Uses* (17 Cal. Code Regs., § 95371 et seq.), identified in the data request, prohibits the use of R-134a and Refrigerants in certain end-uses. Specifically, the regulation prohibits the use of R-134a in: retail food refrigeration equipment; vending machines; cold storage warehouses; household refrigerators and freezers; foams; and aerosols. (17 Cal. Code Regs., § 95374(a), (b).) The project will not use R-134a for any of these uses, so this portion of the regulation does not apply.

The regulation also prohibits the use of “Refrigerants,” which are defined as “any substance, including blends and mixtures, that is a compound or gas used in vapor compression cycle refrigeration for heat transfer purposes and provides a cooling or warming effect.” (17 Cal. Code Regs., § 95373.) “Refrigerants” are prohibited from the following general end-uses: air conditioning equipment; chillers; cold storage warehouses; ice rinks; industrial process refrigeration excluding chillers; other refrigeration; and retail food refrigeration.

The regulation prohibits the use of refrigerants for these end-uses where the Refrigerant has a global warming capacity (GWP) of 150 or greater. (17 Cal. Code Regs., § 95374.) However, the regulation excepts certain uses from its provisions. Relevant here, the prohibitions against use in industrial process refrigeration do not apply where the equipment “contains 50 pounds of refrigerant or less.” (*Id*. at § 95375(c)(2)(B).) Consistent with CARB’s Refrigerant Management Program, the amount of refrigerant is measured from the largest system in a given facility, rather than the combined charge of all systems at the facility (CARB Refrigerant Management Program, https://ww2.arb.ca.gov/our-work/programs/refrigerant-management-program/rmp-businesses-refrigeration-systems).

The definition of Refrigerants appears to encompass the use of R-134a in the vapor compression cycle of the TMS. Further, the MP2XL TMS may qualify as an “industrial process refrigeration excluding chillers” because the TMS is used for cooling purposes within the industrial energy storage process. (See 17 Cal. Code Regs., § 95373.) Per the California Emissions Estimator Model (CalEEMod) Handbook for Analyzing GHG Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity, R-134a has a GWP of 1,430 and thus would be prohibited from being used in the MP2XL unit unless an applicable exception applies. As indicated above, one MP2XL unit will contain 3.3 pounds of R-134a Refrigerant. Accordingly, based on the amount of Refrigerant used in an individual MP2XL unit, the regulation does not prohibit the use of R-134a in the MP2XL units because although the MP2XL unit may involve industrial process refrigeration, less than 50 pounds of Refrigerant will be used. Thus, the Project will comply with the HFC prohibition regulation.

1.6 REV 2 DR GHG-2

REV 2 DR GHG-2 *Please provide calculations of refrigerant usage/leakage and the contribution to GHG emissions.*

The Applicant provides the following response to REV 2 DR GHG-2:

The GHG emission calculations related to use of HFCs for refrigerants has been added to the revised CalEEMod modeling and the Revised Air Quality Section 4.1, Table 4.1-9, Estimated Annual Operational GHG Emissions, has been updated to reflect these calculations. The total GHG emissions from construction and operation of the Project would still be minimal and would be below the Federal Prevention of Significant Deterioration Major Source Threshold of 75,000 tons per year. Furthermore, the Project by nature of being an energy storage project would be supportive of the State's Scoping Plan and GHG reduction goals.

1.7 REV 2 DR PH-1

Public Health:

The applicant conducted the Hotspots Analysis and Reporting Program (HARP) modeling analysis and presented the results in Table 4.9-2 of Section 4.9, Public Health (TN 255535-13). Due to changes in construction emissions, staff requires updated modeling results as required by Appendix B (g) (9) (A).

REV 2 DR PH-1. *Please provide the updated construction health risk assessment results to demonstrate that the project impacts would not exceed the South Coast Air Quality Management District (SCAQMD) significance thresholds as required by Appendix B (i) (1) (A).*

The Applicant provides the following response to REV 2 DR PH-1:

The majority (99.98%) of the increase in diesel particulate matter (DPM) emissions related to the November 2024 update resulted from increases in offsite vehicle trip distances for workers/vendor/haul trucks during construction based on the new trip length information. The HRA and AAQA analyses already include the "on-site" or near-by portion of these trips (0.25 miles). There was a very small increase related to daily haul trucks for the delivery of the BESS units but that increase represents a 0.02% increase in the on-site emissions from the project. Given the small magnitude of this increase in DPM emissions, any increase in either the HRA or AAQA results would be negligible, and impacts would remain less than significant. Therefore, we don't believe that an updated HRA or AAQA would be warranted.

1.8 REV 2 DR PH-2

Staff's draft Condition of Certification ***TRANS-1*** *would require the applicant to prepare and implement a Construction Management Plan (CMP), which would include a provision to prohibit truck trips from leaving the site during the hours of 7:00-9:00 AM and 2:00-4:00 PM to avoid the peak times when students are arriving/departing J Serra High School. The configuration of the Camino Capistrano/Rancho Capistrano intersection is such that all vehicles need to turn right (southbound), which necessitates them passing the*

> *high school. Staff needs to understand how this prohibition would affect the onsite toxic air contaminant emissions and associated public health impacts.*
>
> *In addition, for the construction health risk assessment, the application states that the California Emissions Estimator Model (CalEEMod) scenario for the project was adjusted to reduce diesel truck one-way trip distances to 0.25 miles to estimate emissions from truck pass-by at proximate receptors. Staff requires an updated health risk assessment of the public health impacts due to vehicles passing the high school and nearby sensitive receptors as required by Appendix B (g) (9) (A).*
>
> ***REV 2 DR PH-2.** Please update the onsite toxic air contaminant emissions estimation and health risk assessment according to the truck trip prohibition in staff's draft COC **TRANS-1** or justify why an updated analysis is not needed.*

The Applicant provides the following response to REV 2 DR PH-2:

The COC TRANS-1 prohibition on truck trips would not have a beneficial impact on the dispersion modeling analysis provided for the HRA. The nearest and most impacted sensitive receptors to the project site are much closer to the project site than the J Serra High School. Thus, the daily time limitation would not affect the HRA results at those receptors. Furthermore, the HRA evaluates the health risk associated with total DPM emitted over the entire construction period, COC TRANS-1 would not result in an increase in the total number of heavy-duty truck deliveries over the course of construction. Therefore, the HRA results would remain the same under COC TRANS-1.

Regarding including an updated HRA due to vehicles passing the high school and nearby sensitive receptors, please see response below to REV 2 DR PH-3.

1.9 REV 2 DR PH-3

> ***REV 2 DR PH-3.** Please provide offsite toxic air contaminant emissions estimation and health risk assessment of the impacts due to vehicles passing the high school and nearby sensitive receptors.*

The Applicant provides the following response to REV 2 DR PH-3:

Our responses above to REV 2 DR AQ-4 also are applicable to the HRA as both the HRA and AAQA utilize similar emission source methodology. As we explained:

The COC TRANS-1 prohibition on trucks trips would not have an impact on the dispersion modeling analysis provided for the HRA. The nearest and most impacted sensitive receptors to the project site are much closer to the project site than the J Serra High School. Thus, the daily time limitation would not affect the HRA results at those receptors, and similarly to the school. Furthermore, the HRA evaluates the health risk associated with total DPM emitted over the entire construction period, COC TRANS-1 would not result in an increase in the total number of heavy-duty truck deliveries over the course of construction. Therefore, the HRA results would remain the same under COC TRANS-1. Regarding including an updated dispersion modeling of impact due to vehicles passing the high school and nearby sensitive receptors, please see response below which was provided in REV 2 DR AQ-4:

> *As noted in our response to AQ-4 above, with respect to the offsite criteria air pollutant emissions estimation and ambient air quality analysis of the vehicles passing the high school and nearby sensitive*

receptors - all trips related to the project are captured in the analysis but only 0.25 miles of each trip are included in the air dispersion modeling for the AAQA and HRAs – in order to capture vehicles emissions as they pass the project site and to capture vehicle emission to the nearest receptors to the project site per air district guidance. The additional emissions analysis is not needed near the school for the following reasons:

The heavy-duty truck trips from the project would only pass by the high school for a momentary duration where emissions would disperse rapidly compared to onsite construction equipment. Because of this short time frame, modeling the truck trips next to the high school would not change the results of the most impacted receptors. As noted above, this is in the context of a baseline where the J Serra High School is located 250 feet from I-5, where an average 10,766 trucks pass by the high school on I-5 everyday (CalTrans Traffic Census Program, https://dot.ca.gov/programs/traffic-operations/census). A qualitative discussion of why air quality and public health impacts related to the pass-by of trucks from this project near the school would be nominal is included below as an alternative approach to providing additional dispersion modeling.

- *The total time diesel trucks would be passing by the school represent a very small fraction of the total length of construction and the Office of Environmental Health Hazard Assessment has not identified an acute reference exposure level for diesel particulate matter (DPM). Therefore, there is no acute health risk associated with DPM. The health risk associated with DPM is from long term repeated exposure over an extended time period – such as the course of the entire construction period.*

- *The school is approximately 250 feet west of the I-5 Freeway where an average 10,766 trucks pass by the high school on I-5 every day. This is a much larger source of criteria air pollutant and DPM emissions on an ongoing basis. The additional trips associated with the project during a few months of the construction would be de minimis relative to the baseline emissions.*

- *The school in question is approximately 0.8 miles away from the southeast boundary of the project site, while the predominant wind direction is from the southwest. Therefore, the emissions related to onsite construction (which account of the vast majority of project construction emissions) would minimally compound with the emissions from trucks passing-by the school and to a lesser degree than to sensitive receptors closer to the site.*

- *The criteria air pollutant emissions resulting from the trucks passing the school (approximately 0.33 miles of adjacent roadway travel) would represent a small fraction (less than 0.02%) of the total emissions from the project construction. There is no basis to conclude that offsite emissions from certain trucks during a short period of time would rise to an exposure level of significance.*

- *For the HRA, the closest and most sensitive receptors are nearby residences. The HRA determined that the health risk at the sensitive receptors closest to the project site that would have the highest exposure to DPM would be below the SCAQMD's threshold of significance. Therefore, it is not anticipated that the receptors farther away (J Serra High School) from the project site would see a higher health risk exposure.*

Given these factors, there is no need for additional modeling to demonstrate that the criteria air pollutant emissions and health effects associated with heavy duty trucks passing by the school would be less than *those at the main project site, would not increase exposure at this level beyond the existing baseline near I-5, and would be less than significant.*

4.1 Air Quality

4.1.1 Introduction

This section presents the methodology and results of an analysis performed to assess potential impacts of airborne emissions from the construction and operation of the Compass Energy Storage Project (project) and the project's compliance with applicable air quality requirements. The analysis was prepared following the South Coast Air Quality Management District's (SCAQMD) California Environmental Quality Act (CEQA) Air Quality Handbook (SCAQMD 1993).

Section 4.1.1 presents the introduction to the project. Section 4.1.2 presents the regulatory items affecting new source review. Section 4.1.3 presents data on the emissions of criteria, greenhouse gases and air toxic pollutants from the project. Section 4.1.4 discusses the best available control technology (BACT) evaluations for the project. Section 4.1.5 presents the air quality impact analysis for the project. Section 4.1.6 discusses the meteorological data selection process required to analyze the impacts of the project. Section 4.1.7 presents applicable laws, ordinances, regulations, and standards. Section 4.1.8 contains references cited or consulted in preparing this section. Appendices 4.1A through 4.1C contain the emissions calculations, air quality impact analysis for construction and operation phases, air dispersion modeling information, list of receptors, and regional emissions inventory data.

4.1.2 Regulatory Items Affecting New Source Review

Regulated air emissions from project operations will not exceed federal major source thresholds under nonattainment New Source Review (NSR) or Prevention of Significant Deterioration (PSD) and, therefore, federal NSR will not apply to this project. Because nonattainment NSR does not apply, emission offsets are not required. The project site is located in an area that is considered extreme nonattainment (National Ambient Air Quality Standards [NAAQS] and California Ambient Air Quality Standards [CAAQS]) for 8-hour ozone (1997, 2008, and 2015), extreme nonattainment (NAAQS and CAAQS) for 1-hour ozone (1979), nonattainment for CAAQS particulate matter less than 10 microns (PM_{10}), and serious nonattainment (NAAQS and CAAQS) for particulate matter less than 2.5 microns ($PM_{2.5}$) (2006 and 2012) (SCAQMD 2016).

SCAQMD has an NSR process that is organized into under Regulation XIII – New Source Review, Rules 1300 through 1325. The NSR process requires the following considerations:

- Emission units must meet Best Available Control Technology (BACT). BACT will be met by purchasing engines that conform to the United States Environmental Protection Agency (EPA) Tier 4 emission standards and combust diesel fuel that contains no more than 15 parts per million ppm sulfur.

The project will generate emissions of criteria air pollutants during construction and operation. NSR is concerned with the operational emissions associated with the project. The proposed project would not include any permitted sources such as an emergency generator or other emissions unit. Therefore, BACT requirements would not apply to the proposed project.

The direct construction and operation emissions impacts associated with the project are analyzed according to SCAQMD and California Energy Commission (CEC) modeling requirements. An air quality analysis was conducted to demonstrate that impacts from nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter (PM_{10} and $PM_{2.5}$) will comply with the CAAQS and NAAQS for the applicable averaging periods. Impacts from nearby sources are not anticipated to be significant but will be assessed for criteria pollutants under separate cover if requested by SCAQMD or the CEC. The need for a cumulative source analysis will be assessed after the CEC data adequacy review. A search of the California Air Resources Board (CARB) Pollution Mapping Tool shows that the closest tracked source is an inactive electrical generating facility located approximately 4.5 miles to the southeast of the project. There are no active generating units inside of the CEC's suggested radius of 6 miles to consider nearby sources, therefore, no cumulative air quality modeling protocol is provided in this study.

Worst-case annual emissions for operation are summarized in Table 4.1-1.

Table 4.1-1. Facility Potential to Emit Summary and Major Source/Attainment Status for Operation

Pollutant	Project PTE (tpy)	Federal Attainment	State Attainment	Federal NSR Major Source Threshold (tpy)	Federal PSD Major Source Threshold (tpy)
NO_2	0.004	Y	Y	10	250
CO	0.01	Y	Y	50	250
VOC	0.01	N/A	N/A	10	250
SO_2	0.00003	Y	Y	70	250
PM_{10}	0.002	Y	N	70	250
$PM_{2.5}$	0.001	N-serious	N	70	250
GHG (CO_2e)	~~327~~ 491	N/A	N/A	N/A	75,000
Ozone	N/A	N-extreme	N	N/A	N/A

Notes: tpy = tons per year; N/A = not applicable; NSR = new source review; PSD = prevention of significant deterioration; NO_2 = nitrogen dioxide; CO = carbon monoxide; VOC = volatile organic compounds; SO_2 = sulfur dioxide; PM_{10} = particulate matter less than 10 microns; $PM_{2.5}$ = particulate matter less than 2.5 microns; GHG = greenhouse gases; CO_2e = carbon dioxide equivalent. Greenhouse gas (GHG) can only be a major source under PSD if another regulated pollutant is a major source for PSD.
Source: EPA 2023a.

4.1.3 Emissions Evaluation

4.1.3.1 Facility Emissions

As shown in Table 4.1-1, the proposed project would not result in emissions that exceed the major source screening threshold of 250 tons per year. Therefore, the proposed project would be considered a NSR minor source for all criteria air pollutants under federal regulations. As such, the project will not be required to implement the requirements of the federal PSD program. The SCAQMD's NSR rules requires that all emission units meet BACT standards. BACT requires utilizing engines that conform to the EPA Tier 4 emission standards and combust diesel fuel that contains no more than 15 parts per million (ppm) sulfur. The proposed project would not include any permitted sources such as an emergency generator or boiler. Therefore, BACT requirements would not apply to the proposed project. However, off-road equipment during construction would meet the Tier Final 4 emissions standard although not it is not required by SCAQMD's NSR rules. Criteria air pollutant emissions from the project are discussed in the following sections. Emissions related to hazardous air pollutants (HAPs) are discussed in Section 4.9, Public Health, of this application. Detailed emissions calculations for all air criteria pollutants are provided in Appendix 4.1A. Peak hourly, daily, and annual emissions of criteria air pollutants are based on the anticipated construction schedule and hours of use for the off-road equipment.

4.1.3.2 Normal Operations

Construction and operation of the proposed project would include activities that would require the use of off-road diesel-fueled equipment. Use of the off-road equipment during construction activities would result in criteria air pollutant and toxic air pollutant emissions to the South Coast Air Basin (SCAB). Specifically, criteria air pollutant emissions would include emissions of volatile organic compounds (VOCs), NO_x, CO, sulfur oxides (SO_x), PM_{10}, $PM_{2.5}$, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Air Toxic pollutants would consist of a combination of HAPs and other compound which are commonly generated from the combustion of diesel fuel. Table 4.1-2 lists the pollutants that may potentially be emitted by the project during regular maintenance activities. There are no other significant sources of criteria air pollutant or HAPs resulting from the operation of the project. Commissiong of the project is not anticipated to require significant time or result in emissions that are beyond the scope of normal operation captured in this analysis. As such, no air emission testing is anticipated for commissioning of the project.

Table 4.1-2. Air Pollutants Emitted by the Project

Criteria Air Pollutants	Greenhouse Gases	Toxic Air Contaminants
Volatile Organic Compounds	Carbon Dioxide	Diesel Particulate Matter
Nitrogen Oxides	Methane	—
Carbon Monoxide	Nitrous Oxide	
Particulate Matter Less than 10 microns	—	
Particulate Matter Less than 2.5 microns		

4.1.3.3 Criteria Pollutant Emissions

Criteria air pollutant emissions would be released from the use of diesel fueled off-road equipment during construction and from periodic maintenance during operation. Table 4.1-3 shows the maximum short term (pounds per hour [lb/hr]) and annual criteria pollutant emissions for the worst-case scenario during operation. See Appendix 4.1A for detailed calculations for criteria air pollutant emissions.

Table 4.1-3. Facility Maximum Emissions Rate and PTE Summary for Operation

Criteria Air Pollutants	Maximum Emissions Rate (lb/hr)	Potential to Emit (tpy)
NO_2	0.4422	0.004
CO	0.4131	0.01
VOC	0.0514	0.01
SO_2	0.0012	0.00003
PM_{10}	0.0253	0.002
$PM_{2.5}$	0.0183	0.001
CO_2e	315.75	~~327~~ 491

Source: Appendix 4.1A.
Notes: lb/hr = pounds per hour; tpy = tons per year; NO_x = nitrogen oxides; CO = carbon monoxide; VOC = volatile organic compounds; SO_2 = sulfur dioxide; PM_{10}/$PM_{2.5}$ = particulate matter less than 10 or less than 2.5 microns; CO_2e = carbon dioxide equivalent.

Greenhouse Gas Emissions

GHG emissions would be released from the use of diesel fueled off-road equipment during construction and from periodic maintenance during operation. Greenhouse gas (GHG) emissions have been estimated for both construction and operation of the project. Table 4.1-3 shows the GHG emissions from operation of the project. Appendix 4.1A provides GHG emissions details for all phases of construction.

4.1.3.4 Hazardous Air Pollutants

Section 4.9, Public Health, provides a detailed quantitative analysis on HAPs emissions from operation of the project and a health risk assessment.

4.1.3.5 Construction Emissions

Construction of the proposed project is estimated to require 15 months to complete. Construction activity and the resulting emissions at the project site would be in line with emissions at most construction sites. Construction of the project would result in the temporary addition of pollutants to the local airshed caused by on-site sources (e.g., off-road construction equipment, soil disturbance, and VOC off-gassing from architectural coatings and asphalt pavement. Specifically, entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. Internal combustion engines used by construction equipment, haul trucks, vendor trucks (i.e., delivery trucks), and worker vehicles would result in emissions of VOC, NO_x, CO, PM_{10}, and $PM_{2.5}$. Construction emissions can vary substantially from day to day depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. Emissions estimates resulting from construction of the project can be found in Appendix 4.1A.

The proposed project would be required to incorporate reduction measures as required by SCAQMD Rule 403 and Rule 1113. SCAQMD Rule 403, Fugitive Dust, requires the implementation of measures to control the emission of visible fugitive/nuisance dust, such as wetting soils that would be disturbed. It was assumed that the active sites would be watered at least twice daily. Rule 1113, Architectural Coatings, requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories.

The SCAQMD CEQA Air Quality Significance Thresholds, as revised in March 2023, set forth quantitative emission significance thresholds for criteria air pollutants, which, if exceeded, would indicate the potential for a project to contribute to violations of the NAAQS or CAAQS. Table 4.1-4 lists the revised SCAQMD Air Quality Significance Thresholds (SCAQMD 2023).

Table 4.1-4. South Coast Air Quality Management District Air Quality Significance Thresholds

Criteria Pollutants Mass Daily Thresholds		
Pollutant	Construction (Pounds per Day)	Operation (Pounds per Day)
VOCs	75	55
NO_x	100	55
CO	550	550
SO_x	150	150

Table 4.1-4. South Coast Air Quality Management District Air Quality Significance Thresholds

Criteria Pollutants Mass Daily Thresholds		
Pollutant	**Construction (Pounds per Day)**	**Operation (Pounds per Day)**
PM_{10}	150	150
$PM_{2.5}$	55	55
Lead[a]	3	3
TACs and Odor Thresholds		
TACs[b]	Maximum incremental cancer risk ≥10 in 1 million Cancer Burden >0.5 excess cancer cases (in areas ≥1 in 1 million) Chronic and acute hazard index ≥1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	

Source: SCAQMD 2023.
Notes: VOCs = volatile organic compounds; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; TAC = toxic air contaminant; SCAQMD = South Coast Air Quality Management District.
a The phase-out of leaded gasoline started in 1976. Since gasoline no longer contains lead, the project is not anticipated to result in impacts related to lead; therefore, it is not discussed in this analysis.
b TACs include carcinogens and noncarcinogens.

Table 4.1-5 shows the estimated maximum daily construction emissions associated with the construction phase of the project.

Table 4.1-5. Estimated Maximum Daily Construction Criteria Air Pollutant Emissions

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds Per Day					
2025	4.19 ~~3.96~~	60.15 ~~58.36~~	191.88 ~~181.36~~	0.38 ~~0.38~~	20.57 ~~16.92~~	7.42 ~~6.54~~
2026	1.15 ~~1.03~~	31.22 ~~16.27~~	53.64 ~~46.89~~	0.19 ~~0.09~~	5.62 ~~1.15~~	1.76 ~~0.39~~
SCAQMD Threshold	*75*	*100*	*550*	*150*	*150*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Appendix 4-1A.
Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SCAQMD = South Coast Air Quality Management District.
The values shown are the maximum summer or winter daily emissions results from the California Emissions Estimator Model (CalEEMod).
These estimates reflect control of fugitive dust required by SCAQMD Rule 403.

As shown in Table 4.1-5 daily construction emissions would not exceed the SCAQMD significance thresholds for VOC, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ during project construction, and short-term construction impacts would be less than significant.

Localized Significance Thresholds Analysis

Construction activities associated with the project would result in temporary sources of on-site fugitive dust and construction equipment emissions. A localized significance threshold (LST) analysis has been prepared to determine potential impacts to nearby sensitive receptors during construction of the project. As indicated in the discussion of the thresholds of significance, SCAQMD recommends the evaluation of localized NO_2, CO, PM_{10}, and $PM_{2.5}$ impacts as a result of construction activities to sensitive receptors in the immediate vicinity of the project site. The impacts were analyzed using methods consistent with those in SCAQMD's Final Localized Significance Threshold Methodology (20089). According to the Final Localized Significance Threshold Methodology, "off-site mobile emissions from the project should not be included in the emissions compared to the LSTs" (SCAQMD 20089). Trucks and worker trips associated with the project are not expected to cause substantial air quality impacts to sensitive receptors along off-site roadways since emissions would be relatively brief in nature and would cease once the vehicles pass through the main streets. Nonetheless, if effort to conservatively capture potential vehicle activity within the project boundary (i.e., fence line), a small portion (i.e., 1,000 feet [0.19 miles]) of the off-site vehicle travel for worker vehicles, vendor trucks, and haul trucks were conservatively assumed as on-site emissions for the LST analysis. The allowable emission rates depend on the following parameters:

1. Source-Receptor Area (SRA) in which the project is located
2. Size of the project site
3. Distance between the project site and the nearest sensitive receptor (e.g., residences, schools, hospitals)

The project site is located in SRA 21 (Capistrano Valley). LST pollutant screening level concentration data is currently published for 1-, 2-, and 5-acre sites for varying distances (25, 50, 100, 200, and 500 meters). The SCAQMD "Fact Sheet for Applying CalEEMod to Localized Significance Thresholds" (SCAQMD 2011) provides estimated acres per 8-hour day for crawler tractors, graders, rubber-tired dozers, and scrapers to assist in estimating the maximum number of acres disturbed on the peak day. Because these earth-moving pieces of equipment are anticipated to be used, the estimated maximum acres per day using this approach would be 2 acres. Therefore 2-acre site was assumed for the look-up tables. The nearest sensitive-receptor land use is located approximately 750 feet southeast of the project site. Accordingly, the distance in the LST look-up table of 200 meters is assumed to conduct a conservative analysis. The estimated maximum daily on-site construction emissions generated by the project are presented in Table 4.1-6 and compared to the applicable SCAQMD LSTs.

Table 4.1-6. Localized Significance Thresholds Analysis for Project Construction

Maximum On-Site Emissions	NO_2	CO	PM_{10}	$PM_{2.5}$
	Pounds per Day			
Summer				
2025	30.49	96.52	0.30	0.29
2026	N/A	N/A	N/A	N/A
Maximum Daily Emissions	**30.49**	**96.52**	**0.30**	**0.29**
Winter				
2025	34.46	160.43	8.30	4.09
2026	14.98	44.20	0.13	0.13
Maximum Daily Emissions	**34.46**	**160.43**	**8.30**	**4.09**
SCAQMD LST	*165*	*2,615*	*55*	*22*
LST Exceeded?	**No**	**No**	**No**	**No**

Source: SCAQMD 2008.
Notes: NO_2 = nitrogen dioxide; CO = carbon monoxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable or available; SCAQMD = South Coast Air Quality Management District; LST = localized significance threshold.
Localized significance thresholds are shown for a 2-acre project site corresponding to a distance to a sensitive receptor of 200 meters.

As shown in Table 4.1-6, proposed construction activities would not generate emissions in excess of site-specific LSTs for NO_x, CO, PM_{10}, and $PM_{2.5}$.

Construction GHG emissions

Construction of the Project would result in emissions of GHG emissions primarily associated with use of off-road construction equipment, on-road haul and vendor (material delivery) truck trips, and worker vehicle trips. A detailed depiction of the construction schedule—including information regarding phasing, equipment used during each phase, haul trucks, vendor trucks, and worker vehicles—is included in Appendix 4.1A. Table 4.1-7 shows the estimated annual GHG construction emissions associated with the Project. Complete details of the construction emissions calculations are provided in Appendix 4.1A.

Table 4.1-7. Estimated Annual Construction GHG Emissions

Year	CO2	CH4	N2O	CO2e
	Metric Tons			
2024	3,894.52 ~~2,313.48~~	0.20 ~~0.10~~	0.32 ~~0.09~~	3,998.85 ~~2,343.88~~
2025	576.76 ~~214.66~~	0.03 ~~0.008~~	0.06 ~~0.006~~	596.54 ~~216.88~~
2060	307.98 ~~270.57~~	<0.01 ~~0.009~~	<0.01 ~~0.002~~	309.26 ~~271.65~~
Total	**4,779.26** ~~**2,313.477**~~	**0.24** ~~**0.1**~~	**0.39** ~~**0.09**~~	**4,950.65** ~~**2,832.41**~~
			Amortized Emissions (30 years)	*163.45* ~~*94.41*~~

Source: CalEEMod Version 2022.1.
Notes: GHG = greenhouse gas; CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent. See Appendix 4.1A for complete results. <0.01 = reported value is less than 0.01.

As shown in Table 4.1-7, the estimated total GHG emissions from construction of the Project would be approximately 2,832 MT CO_2e. When amortized over 30 years, the estimated annual GHG emissions from construction of the Project would be approximately 163 MT CO_2e per year.

4.1.3.6 Operational Emissions

Operation of the proposed project would generate VOC, NO_x, CO, SO_x, PM_{10}, ~~and~~ $PM_{2.5}$ and GHG emissions from area sources, energy sources ~~and~~ mobile sources and off-road equipment, which are discussed below. Emissions from these sources were estimated based on California Emissions Estimator Model (CalEEMod) default assumptions for operations of the proposed project land uses. It was assumed that the project would be operational following the completion of construction, which would occur in 2026.

Area Sources

The area source category calculates direct sources of air pollutant emissions located at the project site, including consumer product use and landscape maintenance equipment. CalEEMod defaults were used to estimate emissions from area sources during operation of the project.

Consumer products are various solvents used in non-industrial applications that emit VOCs during their product use, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Consumer product VOC emissions are estimated in CalEEMod based on the floor area of buildings and on the default factor of pounds of VOC per building square foot per day. The CalEEMod default utilization rates and emission factors were assumed.

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chainsaws, and hedge trimmers, as well as air compressors, ~~, generators,~~ and pumps. The emissions associated from landscape equipment use were estimated using CalEEMod. The emission factors are multiplied by the number of summer days that represent the number of operational days.

Energy Sources

As represented in CalEEMod, energy sources include emissions associated with building electricity. Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for GHGs in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off site. The project does not include the use of natural gas during operation. Therefore, no emissions associated with energy sources were quantified for the air quality analysis. The estimated annual electricity consumption from the project was provided by the applicant and assumed to be 10,950 megawatt-hours per year. This estimate includes all energy demand to power HVAC equipment associated with BESS cooling and energy loss from charging and discharging the BESS.

Mobile Sources

Following the completion of construction activities, the project would generate criteria pollutant emissions from mobile sources (vehicular traffic) as a result of the periodic maintenance of the project. The project was assumed to require up to 2 employees visiting the BESS facility sites 1 day a week for maintenance. The estimated trip lengths and trip modes were based on data provided by the project applicant. CalEEMod was used to estimate emissions from proposed vehicular sources (refer to Appendix 4.1A). CalEEMod default data, including temperature, trip characteristics, variable start information, and emissions factors, were conservatively used for the model inputs. Project-related traffic was assumed to include a mixture of vehicles in accordance with the associated use, as modeled within CalEEMod, which is based on the CARB EMFAC2021 model. Emission factors representing the vehicle mix and emissions for 2026 were used to estimate emissions associated with vehicular sources.

Off-Road Sources

During irregular maintenance, the project may require the movement or replacement of battery enclosures during the lifetime of the project. As such, the use of one crane was assumed to assist the lifting and movement of the BESS containers. CalEEMod was used to estimate criteria air pollutant emissions of the crane assuming 8 hours of operation on 1 day every year.

Solid Waste

The Project would generate solid waste from the on-site employees, and therefore, result in CO_2e emissions associated with landfill off-gassing. CalEEMod default values for solid waste generation were used to estimate GHG emissions associated with solid waste.

Water and Wastewater

Water consumption estimates for the operations and maintenance building for both indoor and outdoor water use were estimated using CalEEMod default values. Electricity use for water supply is based on the electric pump rating, pump flow rate, electricity intensity factors from CalEEMod for the County, and the indoor and outdoor water use default values in CalEEMod.

Criteria Air Pollutant Operational Emissions

Table 4.1-7 8 presents the unmitigated maximum daily emissions associated with the operation of the project in 2026 after all phases of construction have been completed. Complete details of the emissions calculations are provided in Appendix 4.1A. Emissions represent maximum of summer and winter. "Summer" emissions are representative of the conditions that may occur during the ozone (O_3) season (May 1 to October 31), and "winter" emissions are representative of the conditions that may occur during the balance of the year (November 1 to April 30).

Table 4.1-78. Estimated Maximum Daily Operational Criteria Air Pollutant Emissions

Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Summer						
Mobile	0.01	0.09	0.19	<0.01	0.06	0.02
Area	0.03	<0.01	0.04	<0.01	<0.01	<0.01
Energy	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.37	3.45	3.07	<0.01	0.14	0.13
Total	**0.41**	**3.54**	**3.30**	**0.01**	**0.20**	**0.15**
Winter						
Mobile	0.01	0.09	0.17	<0.01	0.06	0.02
Area	0.02	N/A	N/A	N/A	N/A	N/A
Energy	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	0.37	3.45	3.07	0.01	0.14	0.13
Total	**0.40**	**3.54**	**3.24**	**0.01**	**0.20**	**0.15**
Maximum Daily Emissions						
Maximum	**0.41**	**3.54**	**3.30**	**0.01**	**0.20**	**0.15**
SCAQMD threshold	*55*	*55*	*550*	*150*	*150*	*55*
Threshold exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable or available; SCAQMD = South Coast Air Quality Management District. <0.01 = reported value is less than 0.01.
See Appendix 4.1A for complete results.
The values shown are the maximum summer or winter daily emissions results from CalEEMod. Columns may not add due to rounding.

As shown in Table 4.1-87, daily operational emissions for the project would not exceed SCAQMD's significance thresholds for any criteria air pollutant. Therefore, the project would result in a **less-than-significant impact** related to emissions of criteria air pollutant emissions during operation.

GHG Operational Emissions

Table 4.1-9 shows the estimated annual GHG operational emissions associated with the Project. Total annual operational emissions were calculated in CalEEMod and combined with amortized (30 years) construction emissions.

Table 4.1-9. Estimated Annual Operational GHG Emissions

Emissions Source	CO_2	CH_4	N_2O	CO_2e
	Metric Tons per Year			
Area	0.02	<0.01	<0.01	0.02
Energy	224.00	0.16	0.02	234.02
Mobile	2.57	<0.01	<0.01	2.66
Waste	0.11	0.01	0.00	0.39
Water	0.19	0.01	<0.01	0.44
Off-Road	0.45	<0.01	<0.01	0.45
Refrigerants	-	-	-	89.42
			Amortized Construction Emissions (30 years)	*163.45* ~~94.41~~
			Total Project Emissions	***490.84*** ~~**332.08**~~

Source: See Appendix 4.1A for complete results.
Notes: GHG = greenhouse gas; MT = metric tons; CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent. <0.01 = reported value is less than 0.01.
[1] Includes sulfur hexafluoride (SF_6) gas emissions from leakage.

As shown in Table 4.1-9, implementation of the Project would result in approximately ~~332~~ 491 MT CO_2e per year including amortized construction emissions. Complete details of the construction emissions calculations are provided in Appendix 4.1A.

4.1.4 Best Available Control Technology Evaluation

4.1.4.1 Current Control Technologies

BACT will be met by purchasing engines certified to meet EPA Tier 4 emissions for the applicable size and type of engine. Based on the proposed engines for project operation, Table 4.1-10~~8~~ shows emission limits must be met per SCAQMD BACT Guidelines for Non-Major Polluting Facilities.

Table 4.1-10~~8~~. SCAQMD BACT Guidelines for Non-major Polluting Facilities – Portable Engines[a]

Subcategory	Rating Size (horsepower)	Criteria Air Pollutants (g/kW-hr)					
		VOCs	NO_x	NO_x + NMHC[b]	SO_x	CO	PM[c]
Compression Ignition[d]	50 <HP>75	NA	NA	4.7	Sulfur content no greater than 0.0015% by weight	5.0	0.03
	75<HP>175		0.40	0.19		5.0	0.02
	175<HP>750[e]		0.4	0.19		3.5	0.02
	>750 HP		3.5	0.4		3.5	0.10

Table 4.1-10~~8~~. SCAQMD BACT Guidelines for Non-major Polluting Facilities – Portable Engines[a]

Subcategory	Rating Size (horsepower)	Criteria Air Pollutants (g/kW-hr)					
		VOCs	NO_x	NO_x + NMHC[b]	SO_x	CO	PM[c]
Spark Ignition	All	1.5	1.5	NA	NA	.20	NA

Source: SCAQMD 2022b.

Notes: g/kW-hr = grams per kilowatt hour; VOCs = volatile organic compounds; NO_x = oxides of nitrogen; NMHC = non-methane hydrocarbons; SO_x = sulfur oxides; CO = carbon monoxide; PM = particulate matter; HP = horsepower; NA = not applicable.

[a] BACT for portable engines is determined by deemed complete date of permit application, not date of manufacture or installation.

[b] NMHC + NO_x means the sum of non-methane hydrocarbons and oxides of nitrogen emissions, unless specified as "NMHC only," which only includes NMHC emissions.

[c] The PM limits in the table only apply to filterable PM. [d] The engine must be certified by EPA or CARB to meet the Tier 4 emissions requirements of 40 CFR part 89 – Control of Emissions from New and In-use Nonroad Compression-Ignition Engines shown in the table or otherwise demonstrate that it meets the Tier 4 emissions limits. If, because of the averaging, banking, and trading program, there is no new engine from any manufacturer that meets the above standards, then the engine must meet the family emissions limits established by the manufacturer and approved by the EPA. Based on the model year, the CARB Airborne Toxic Control Measure for portable diesel engines requires in-use portable diesel engines to be certified to Tier 1, 2, 3, or 4 by their respective deadlines, all of which have passed.

[e] CARB has extended the Tier 4 Final requirements deadline "until further notice" for Portable, Compression-Ignition Engines for HP > 750.

4.1.4.2 Proposed Best Available Control Technology

No permitted stationary or portable emission sources are proposed as part of the project operation. Therefore, BACT requirements are not applicable to the operation of the project.

4.1.5 Air Quality Impact Analysis

This section discusses the methodology and analysis results. The spatial extent and magnitude of ground-level emissions concentrations resulting from construction of the project. The maximum-modeled concentrations were added to the maximum background concentrations to access against the applicable thresholds. Dispersion modeling methods follow the EPA approved methods established in 40CFR Part 51 Appendix W and SCAQMD Modeling Guidance for AERMOD (SCAQMD n.d.).

4.1.5.1 Climate and Meteorology

Air Quality

The SCAB is characterized as having a Mediterranean climate (typified as semiarid with mild winters, warm summers, and moderate rainfall). The general region lies in the semi-permanent high-pressure zone of the eastern Pacific; as a result, the climate is mild and tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

Moderate temperatures, comfortable humidity, and limited precipitation characterize the climate in the SCAB. The average annual temperature varies little throughout the SCAB, averaging 75°F. However, with a less-pronounced oceanic influence, the eastern inland portions of the SCAB show greater variability in annual minimum and maximum temperatures. All portions of the SCAB have recorded temperatures over 100°F in recent years. Although the SCAB has a semiarid climate, the air near the surface is moist because of the presence of a shallow marine layer. Except for infrequent periods when dry air is brought into the SCAB by offshore winds, the ocean effect is dominant. Periods with heavy fog are frequent, and low stratus clouds, occasionally referred to as "high fog," are a characteristic climate feature. Annual average relative humidity is 70% at the coast and 57% in the eastern part of the SCAB. Precipitation in the SCAB is typically 9 to 14 inches annually and is rarely in the form of snow or hail because of typically warm weather. Most of the rainfall in Southern California occurs between late fall and early spring, with most rain typically occurring in the months of January and February (SCAQMD 2017).

GHGs

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind patterns, lasting for an extended period of time (decades or longer). The Earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human, can cause changes in Earth's energy balance, including variations in the sun's energy reaching Earth, changes in the reflectivity of Earth's atmosphere and surface, and changes in the greenhouse effect, which affects the amount of heat retained by Earth's atmosphere (EPA 2023c).

The greenhouse effect is the trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. The greenhouse effect traps heat in the troposphere through a threefold process as follows: Short-wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long-wave radiation; and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and toward the Earth. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature and creates a pleasant, livable environment on the Earth. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth's surface temperature to rise.

The scientific record of the Earth's climate shows that the climate system varies naturally over a wide range of time scales and that in general, climate changes prior to the Industrial Revolution in the 1700s can be explained by natural causes, such as changes in solar energy, volcanic eruptions, and natural changes in GHG concentrations. Recent climate changes, in particular the warming observed over the past century, however, cannot be explained by natural causes alone. Rather, it is extremely likely that human activities have been the dominant cause of that warming since the mid-20th century and is the most significant driver of observed climate change (IPCC 2014; EPA 2023c). Human influence on the climate system is evident from the increasing GHG concentrations in the atmosphere, positive radiative forcing, observed warming, and improved understanding of the climate system (IPCC 2014). The atmospheric concentrations of GHGs have increased to levels unprecedented in the last 800,000 years, primarily from fossil fuel emissions and secondarily from emissions associated with land use changes (IPCC 2014). Continued emissions of GHGs will cause further warming and changes in all components of the climate system, which is discussed further in Section 3.1.5, Potential Effects of Climate Change.

4.1.5.2 Dispersion Modeling Methodology

Construction Modeling Scenario

See Section 4.1.3.5 for a discussion of the construction modeling scenario.

Operational Modeling Scenario

The project will include the development of an approximately 250 MW BESS and associated infrastructure. A BESS is a stationary equipment that receives electrical energy and then utilizes batteries to store that energy to supply electrical energy at a future time. Power released or captured by the proposed project will be transferred to and from the SDG&E Trabuco to Capistrano 138 kV transmission line via a loop-in generation transmission line that will interconnect to an SDG&E switchyard to be constructed within the project site. The project will consist of lithium-ion batteries, installed in racks and contained inside non-habitable enclosures; inverters; MV transformers; an SDG&E switchyard; a project substation; and other associated equipment. The project site would be monitored remotely and would only require periodic maintenance. Therefore, the proposed project would not result in regular on-site emissions during normal operation, and emission concentrations are anticipated to be less than those from construction. Therefore, no operational modeling was conducted.

Emissions Inventory

As discussed in Section 4.1.3.5, construction of the project would result in the temporary addition of pollutants to the local airshed caused by on-site sources (e.g., off-road construction equipment, soil disturbance, and VOC off-gassing from architectural coatings and asphalt pavement). Specifically, entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. Internal combustion engines used by construction equipment, haul trucks, vendor trucks (i.e., delivery trucks), and worker vehicles would result in emissions of VOC, NO_x, CO, PM_{10}, and $PM_{2.5}$. CalEEMod Version 2022.1 was used to estimate emissions from construction of the proposed project. Detailed emissions assumptions can be found in Appendix 4.1A A.

4.1.5.3 Additional Model Selection

Additional models/programs described below were used to quantify pollutant impacts on the surrounding environment based on the emission sources operating parameters and their locations.

- CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state to quantify criteria air pollutant and GHG emissions associated with construction activities and operation of a variety of land use projects, such as residential, commercial, and industrial facilities. CalEEMod input parameters, including the land use type used to represent the project and its size, construction schedule, and anticipated use of construction equipment, were based on information provided by the applicant or default model assumptions if project specifics were unavailable.
- HARP Air Dispersion Modeling and Risk Tool (version 21081) was used to estimate human health risks related to cancer, chronic non-cancer, and acute health effects. More discussion about HARP is provided in Section 4.9, Public Health.

4.1.5.4 Modeling Parameters

The dispersion modeling was performed using the American Meteorological Society/EPA Regulatory Model (AERMOD), which is the model SCAQMD requires for atmospheric dispersion of emissions. AERMOD is a steady-state Gaussian plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of surface and elevated sources, building downwash, and simple and complex terrain (EPA 2023b). Principal parameters of this modeling are presented in Table 4.1-911.

Table 4.1-~~9~~11. AERMOD Principal Parameters

Parameter	Details
Meteorological Data	The latest 3-year meteorological data (2011–2014 and 2016) for the Mission Viejo Station were obtained from SCAQMD as the recommended meteorological station and input to AERMOD.
Urban versus Rural Option	Urban areas typically have more surface roughness, as well as structures and low-albedo surfaces that absorb more sunlight—and thus more heat—relative to rural areas. Per the SCAQMD guidelines, the land use procedure from 4.4.1 of the OEHHA Guidance Manual indicated that urban dispersion was appropriate for the project site.
Terrain Characteristics	The elevation of the modeled site is 67 meters above sea level. Digital elevation model files were imported into AERMOD so that complex terrain features were evaluated as appropriate.
Elevation Data	Digital elevation data were imported into AERMOD, and elevations were assigned to the emission sources and receptors. Digital elevation data were obtained through AERMOD View in the U.S. Geological Survey's National Elevation Dataset format with a 30-meter resolution.
Emission Sources and Release Parameters	Air dispersion modeling from construction equipment was conducted using emissions estimated using CalEEMod, assuming emissions would occur 8 hours per day, 5 days per week. Vehicle trips were modified to account only for emissions occurring within 0.25 miles of the project site (SJVAPCD 2018). The proposed project area was modeled as a series of adjacent line-volume sources.
Source Release Characterizations	The modeled line of volume sources was placed to cover the site for exhaust emissions. A plume height dimension of 10 meters, a plume width dimension of 10 meters, and a release height of 5 meters was assumed for off-road equipment and diesel trucks (SCAQMD 2008).
Receptors	A cartesian plant boundary with 25-meter spacing was placed around the project site. A uniform cartesian grid of 50-meter spacing was placed out to 500 meters from the project site, and a uniform cartesian grid of 100-meter spacing was placed out to 1,000 meters from the project site (SCAQMD n.d.).
Variable Emissions	The variable emissions scenario was used to limit the emissions from construction in accordance with the noise ordinance of the City of San Juan Capistrano Municipal Code, Title 9, Chapter 3, Article 5, which limits construction from 6:00 p.m. to 7:00 a.m. on Monday through Friday, or from 4:30 p.m. to 8:30 a.m. on Saturday.

Notes: AERMOD = American Meteorological Society/EPA Regulatory Model; SCAQMD = South Coast Air Quality Management District; CalEEMod = California Emissions Estimator Model.
See Appendix 4.1B for additional information.

All NO_2 concentrations were estimated using the Ambient Ratio Method Version 2 (ARM2), which is a regulatory default option and commonly used in practice. The default minimum NO_2/NO_x conversion ratio of 0.5 and maximum conversion ratio of 0.9 were used for both 1-hour and annual averaging periods. There are no point sources associated with construction or operation of the project. Therefore, stack height analysis is not applicable. All pollutants were modeled in accordance with their respective ambient air quality standards (AAQS) averaging times.

Monitoring data for the SCAB were obtained via the SCAQMD's Historical Data by Year for comparison to applicable AAQSs. Modeled maximum 24-hour and annual concentrations of PM_{10} and $PM_{2.5}$ were compared directly to the significant change thresholds of 2.5 and 1.0 micrograms/cubic meter, respectively.

The most recent 3 years of available monitoring data were used to develop background concentration values. For all CAAQS and most NAAQS pollutants, the maximum value from the most recent 3 years were used except for the

NAAQS pollutants with special design values including the 1-hour NO_2 (3-year average of the 98th percentile of the daily maximum 1-hour average) and 1-hour SO_2 (3-year average of the 99th percentile of the daily maximum 1-hour average) (SCAQMD n.d.).

4.1.5.5 Background Air Quality

Ambient Air Quality Standards

Criteria air pollutants are defined as pollutants for which the federal and state governments have established AAQS, or criteria, for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include O_3, NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and lead. The federal government and state government have established NAAQS and CAAQS, respectively, for each of these pollutants. The CAAQS are generally more restrictive than the NAAQS. The NAAQS and CAAQS are presented in Table 4.1-12~~0~~, Ambient Air Quality Standards.

Table 4.1-12~~0~~. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	Primary[c,d]	Secondary[c,e]
Ozone (O_3)	1 hour	0.09 ppm (180 μg/m³)	—	Same as Primary Standard[f]
	8 hours	0.070 ppm (137 μg/m³)	0.070 ppm (137 μg/m³)[f]	
Nitrogen dioxide (NO_2)[g]	1 hour	0.18 ppm (339 μg/m³)	0.100 ppm (188 μg/m³)	Same as Primary Standard
	Annual Arithmetic Mean	0.030 ppm (57 μg/m³)	0.053 ppm (100 μg/m³)	
Carbon monoxide (CO)	1 hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	None
	8 hours	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	
Sulfur dioxide (SO_2)[h]	1 hour	0.25 ppm (655 μg/m³)	0.075 ppm (196 μg/m³)	—
	3 hours	—	—	0.5 ppm (1,300 μg/m³)
	24 hours	0.04 ppm (105 μg/m³)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
Course Particulate Matter (PM_{10})[i]	24 hours	50 μg/m³	150 μg/m³	Same as Primary Standard
	Annual Arithmetic Mean	20 μg/m³	—	
Fine Particulate Matter ($PM_{2.5}$)[i]	24 hours	—	35 μg/m³	Same as Primary Standard
	Annual Arithmetic Mean	12 μg/m³	9~~12~~ μg/m³	15.0 μg/m³
Lead[j,k]	30-day Average	1.5 μg/m³	—	—
	Calendar Quarter	—	1.5 mg/m³ (for certain areas)k	Same as Primary Standard

Table 4.1-1~~2~~0. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	Primary[c,d]	Secondary[c,e]
	Rolling 3-Month Average	—	0.15 mg/m3	
Hydrogen sulfide	1 hour	0.03 ppm (42 μg/m3)	—	—
Vinyl chloride[j]	24 hours	0.01 ppm (26 μg/m3)	—	—
Sulfates	24 hours	25 μg/m3	—	—
Visibility-reducing particles	8 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%	—	—

Source: CARB 2016.

Notes: ppm = parts per million by volume; μg/m^3 = micrograms per cubic meter; mg/m^3= milligrams per cubic meter; PST = Pacific Standard Time.

a California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility-reducing particles—are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

d National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

e National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

f On October 1, 2015, the primary and secondary NAAAQS for O_3 were lowered from 0.075 ppm to 0.070 ppm.

g To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (ppb). Note that the national 1-hour standard is in units of ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

h On June 2, 2010, a new 1-hour SO_2 standard was established, and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment of the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

i On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 μg/m^3 to 12.0 μg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 μg/m^3, as was the annual secondary standard of 15 μg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 μg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

j CARB has identified lead and vinyl chloride as toxic air contaminants (TACs) with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

k The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

Criteria Air Pollutant Health Effects

Criteria air pollutants and their health effects are discussed in the following paragraphs.[1]

Ozone. O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors. These precursors are mainly NO_x and VOCs. The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer (stratospheric O_3) and at the Earth's surface in the troposphere (ground-level O_3).2 The O_3 that EPA and CARB regulate as a criteria air pollutant is produced close to the ground level, where people live, exercise, and breathe. Ground-level O_3 is a harmful air pollutant that causes numerous adverse health effects and is thus considered "bad" O_3. Stratospheric, or "good," O_3 occurs naturally in the upper atmosphere, where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the Earth's atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes (EPA 2023b~~EPA 2013~~).

Inhalation of O_3 causes inflammation and irritation of the tissues lining human airways, causing and worsening a variety of symptoms. Exposure to O_3 can reduce the volume of air that the lungs breathe in, thereby causing shortness of breath. O_3 in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. The occurrence and severity of health effects from O_3 exposure vary widely among individuals, even when the dose and the duration of exposure are the same. Research shows adults and children who spend more time outdoors participating in vigorous physical activities are at greater risk from the harmful health effects of O_3 exposure. While there are relatively few studies on the effects of O_3 on children, the available studies show that children are no more or less likely to suffer harmful effects than adults. However, there are a number of reasons why children may be more susceptible to O_3 and other pollutants. Children and teens spend nearly twice as much time outdoors and engaged in vigorous activities as adults. Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults. Also, children are less likely than adults to notice their own symptoms and avoid harmful exposures. Further research may be able to better distinguish between health effects in children and adults. Children, adolescents, and adults who exercise or work outdoors, where O_3 concentrations are the highest, are at the greatest risk of harm from this pollutant (CARB 2023b).

Nitrogen Dioxide. NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide, which is a colorless, odorless gas. NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an

[1] The descriptions of the criteria air pollutants and associated health effects are based on EPA's "Criteria Air Pollutants" (EPA 2023c), as well as CARB's "Glossary" (CARB 2023a).

[2] The troposphere is the layer of the Earth's atmosphere nearest to the surface of the Earth. The troposphere extends outward about 5 miles at the poles and about 10 miles at the equator.

important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

A large body of health science literature indicates that exposure to NO_2 can induce adverse health effects. The strongest health evidence, and the health basis for the ambient air quality standards for NO_2, results from controlled human exposure studies that show that NO_2 exposure can intensify responses to allergens in allergic asthmatics. In addition, a number of epidemiological studies have demonstrated associations between NO_2 exposure and premature death, cardiopulmonary effects, decreased lung function growth in children, respiratory symptoms, emergency room visits for asthma, and intensified allergic responses. Infants and children are particularly at risk because they have disproportionately higher exposure to NO_2 than adults due to their greater breathing rate for their body weight and their typically greater outdoor exposure duration. Several studies have shown that long-term NO_2 exposure during childhood, the period of rapid lung growth, can lead to smaller lungs at maturity in children with higher levels of exposure compared to children with lower exposure levels. In addition, children with asthma have a greater degree of airway responsiveness compared with adult asthmatics. In adults, the greatest risk is to people who have chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease (CARB 2023c).

Carbon Monoxide. CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, such as the project location, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, which is a typical situation at dusk in urban areas from November to February. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent.

CO is harmful because it binds to hemoglobin in the blood, reducing the ability of blood to carry oxygen. This interferes with oxygen delivery to the body's organs. The most common effects of CO exposure are fatigue, headaches, confusion and reduced mental alertness, light-headedness, and dizziness due to inadequate oxygen delivery to the brain. For people with cardiovascular disease, short-term CO exposure can further reduce their body's already compromised ability to respond to the increased oxygen demands of exercise, exertion, or stress. Inadequate oxygen delivery to the heart muscle leads to chest pain and decreased exercise tolerance. Unborn babies whose mothers experience high levels of CO exposure during pregnancy are at risk of adverse developmental effects. Unborn babies, infants, elderly people, and people with anemia or with a history of heart or respiratory disease are most likely to experience health effects with exposure to elevated levels of CO (CARB 2023d).

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

Controlled human exposure and epidemiological studies show that children and adults with asthma are more likely to experience adverse responses with SO_2 exposure, compared with the non-asthmatic population. Effects at levels near the 1-hour standard are those of asthma exacerbation, including bronchoconstriction accompanied by symptoms of respiratory irritation such as wheezing, shortness of breath, and chest tightness, especially during exercise or physical activity. Also, exposure at elevated levels of SO_2 (above 1 part ppm) results in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality. Older people and people with cardiovascular disease or chronic lung disease (such as bronchitis or emphysema) are most likely to experience these adverse effects (CARB 2023e.

SO_2 is of concern both because it is a direct respiratory irritant and because it contributes to the formation of sulfate and sulfuric acid in particulate matter (NRC 2005). People with asthma are of particular concern, both because they have increased baseline airflow resistance and because their SO_2-induced increase in airflow resistance is greater than in healthy people, and it increases with the severity of their asthma (NRC 2005). SO_2 is thought to induce airway constriction via neural reflexes involving irritant receptors in the airways (NRC 2005).

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as SO_x, NO_x, and VOCs.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the bloodstream, causing damage elsewhere in the body. Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissue. Suspended particulates also damage and discolor surfaces on which they settle and produce haze and reduce regional visibility.

A number of adverse health effects have been associated with exposure to both $PM_{2.5}$ and PM_{10}. For $PM_{2.5}$, short-term exposures (up to 24-hour duration) have been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days. These adverse health effects have been reported primarily in infants, children, and older adults with preexisting heart or lung diseases. In addition, of all of the common air pollutants, $PM_{2.5}$ is associated with the greatest proportion of adverse health effects related to air pollution, both in the United States and worldwide based on the World Health Organization's Global Burden of Disease Project. Short-term exposures to PM_{10} have been associated primarily with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease, leading to hospitalization and emergency department visits (CARB 2017).

Long-term exposure (months to years) to $PM_{2.5}$ has been linked to premature death, particularly in people who have chronic heart or lung diseases, and reduced lung function growth in children. The effects of long-term exposure to PM_{10} are less clear, although several studies suggest a link between long-term PM_{10} exposure and respiratory mortality. The International Agency for Research on Cancer published a review in 2015 that concluded that particulate matter in outdoor air pollution causes lung cancer (CARB 2017).

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phaseout of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phaseout of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emissions sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient (IQ) performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead.

Greenhouses and other Climate Forcing Substances

A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. GHGs include, but are not limited to, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), water vapor, hydrofluorocarbons (HFCs), hydrochlorofluorocarbons (HCFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3) (see also 14 CCR 15364.5).[3] Some GHGs, such as CO_2, CH_4, and N_2O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Manufactured GHGs, which have a much greater heat-absorption potential than CO_2, include fluorinated gases, such as HFCs, HCFCs, PFCs, and SF_6, which are associated with certain industrial products and processes. The following paragraphs provide a summary of the most common GHGs and their sources.[4]

Carbon Dioxide (CO_2). CO_2 is a naturally occurring gas and a by-product of human activities and is the principal anthropogenic GHG that affects the Earth's radiative balance. Natural sources of CO_2 include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO_2 are from the combustion of fuels such as coal, oil, natural gas, and wood and changes in land use.

Methane (CH_4). CH_4 is produced through both natural and human activities. CH_4 is a flammable gas and is the main component of natural gas. Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide (N_2O). N_2O is produced through natural and human activities, mainly through agricultural activities and natural biological processes, although fuel burning and other processes also create N_2O. Sources of N_2O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (such as in nitric acid production, nylon production,

3 Climate forcing substances include GHGs and other substances such as black carbon and aerosols.

4 The descriptions of GHGs are summarized from the IPCC Fourth Assessment Report (2007), CARB's "Glossary of Terms Used in GHG Inventories" (2018), and EPA's "Climate Change" (2022).

and fossil-fuel-fired power plants), vehicle emissions, and using N_2O as a propellant (such as in rockets, racecars, and aerosol sprays).

Fluorinated Gases. Fluorinated gases (also referred to as F-gases) are synthetic powerful GHGs emitted from many industrial processes. Fluorinated gases are commonly used as substitutes for stratospheric ozone-depleting substances (e.g., CFCs, HCFCs, and halons). The most prevalent fluorinated gases include the following:

- **Hydrofluorocarbons:** HFCs are compounds containing only hydrogen, fluorine, and carbon atoms. HFCs are synthetic chemicals used as alternatives to ozone-depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are used in manufacturing.
- **Perfluorocarbons:** PFCs are a group of human-made chemicals composed of carbon and fluorine only. These chemicals were introduced as alternatives, with HFCs, to the ozone depleting substances. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing. Since PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere, these chemicals have long lifetimes, ranging between 10,000 and 50,000 years.
- **Sulfur Hexafluoride:** SF_6 is a colorless gas soluble in alcohol and ether and slightly soluble in water. SF_6 is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.
- **Nitrogen Trifluoride:** NF3 is used in the manufacture of a variety of electronics, including semiconductors and flat panel displays.

Chlorofluorocarbons (CFCs). CFCs are synthetic chemicals that have been used as cleaning solvents, refrigerants, and aerosol propellants. CFCs are chemically unreactive in the lower atmosphere (troposphere) and the production of CFCs was prohibited in 1987 due to the chemical destruction of stratospheric O_3.

Hydrochlorofluorocarbons (HCFCs). HCFCs are a large group of compounds, whose structure is very close to that of CFCs—containing hydrogen, fluorine, chlorine, and carbon atoms—but including one or more hydrogen atoms. Like HFCs, HCFCs are used in refrigerants and propellants. HCFCs were also used in place of CFCs for some applications; however, their use in general is being phased out.

Black Carbon. Black carbon is a component of fine particulate matter, which has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation, and darkens the surface of snow and ice, which accelerates heat absorption and melting. Black carbon is a short-lived species that varies spatially, which makes it difficult to quantify the global warming potential. Diesel particulate matter emissions are a major source of black carbon and are TACs that have been regulated and controlled in California for several decades to protect public health. In relation to declining diesel particulate matter from the California Air Resources Board's (CARB's) regulations pertaining to diesel engines, diesel fuels, and burning activities, CARB estimates that annual black carbon emissions in California have reduced by 70% between 1990 and 2010, with 95% control expected by 2020 (CARB 2014).

Water Vapor. The primary source of water vapor is evaporation from the ocean, with additional vapor generated by sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves. Water vapor is the most important, abundant, and variable GHG in the atmosphere and maintains a climate necessary for life.

Ozone (O_3). Tropospheric O_3, which is created by photochemical reactions involving gases from both natural sources and human activities, acts as a GHG. Stratospheric O_3, which is created by the interaction between solar ultraviolet radiation and molecular oxygen (O_2), plays a decisive role in the stratospheric radiative balance. Depletion of stratospheric O_3, due to chemical reactions that may be enhanced by climate change, results in an increased ground-level flux of ultraviolet-B radiation.

Aerosols. Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light.

Ambient Air Quality Monitoring Data

The SCAQMD operates a network of ambient air monitoring stations throughout the SCAB, which measure ambient concentrations of pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The Mission Viejo monitoring station represents the closest monitoring station to the project for O_3, CO, PM_{10}, and $PM_{2.5}$. The Anaheim monitoring station represents the closest monitoring station to the project for NO_2; and the Los Angeles monitoring station represents the closest station to the project for SO_2. Ambient concentrations of pollutants from 2020 through 2022 are presented in Table 4.1-1~~1~~3.

Table 4.1-1~~1~~3. Local Ambient Air Quality Data

Monitoring Station	Unit	Averaging Time	Agency/ Method	AAQS	Measured Concentration by Year			Exceedances by Year		
					2020	2021	2022	2020	2021	2022
Ozone (O_3)										
Mission Viejo	ppm	Maximum 1-hour concentration	State	0.09	0.171	0.105	0.110	20	2	1
	ppm	Maximum 8-hour concentration	State	0.070	0.123	0.082	0.089	34	8	6
			Federal	0.070	0.122	0.081	0.088	32	8	5
Nitrogen Dioxide (NO_2)										
Anaheim	ppm	Maximum 1-hour concentration	State	0.18	0.069	0.072	0.062	0	0	0
			Federal	0.100	0.069	0.072	0.062	0	0	0
	ppm	Annual concentration	State	0.030	0.018	0.019	0.018	N/A	N/A	N/A
			Federal	0.053	0.019	0.019	0.019	N/A	N/A	N/A
Carbon Monoxide (CO)										
Mission Viejo	ppm	Maximum 1-hour concentration	State	20	1.7	1	1	0	0	0
			Federal	35	1.7	1	1	0	0	0
	ppm		State	9.0	0.8	0.8	1	N/A	N/A	N/A

Table 4.1-1~~1~~3. Local Ambient Air Quality Data

Monitoring Station	Unit	Averaging Time	Agency/ Method	AAQS	Measured Concentration by Year			Exceedances by Year		
					2020	2021	2022	2020	2021	2022
		Maximum 8-hour concentration	Federal	9	0.8	1.8	1	N/A	N/A	N/A
Sulfur Dioxide (SO_2)										
Los Angeles	ppm	Maximum 1-hour concentration	Federal	0.075	0.006	0.007	0.006	0	0	0
	ppm	Maximum 24-hour concentration	State	0.04	0.009	0.001	0.001	0	0	0
			Federal	0.140	0.009	0.001	0.001	0	0	0
	ppm	Annual concentration	Federal	0.030	0.001	0.001	0.0004	N/A	N/A	N/A
Coarse Particulate Matter (PM_{10})[a]										
Mission Viejo	μg/m³	Maximum 24-hour concentration	State	50	55.1	34.6	30.4	2	0	ND
			Federal	150	56.2	35.2	31.0	ND	0	ND
	μg/m³	Annual concentration	State	20	ND	15.8	ND	N/A	N/A	N/A
Fine Particulate Matter ($PM_{2.5}$)[a]										
Mission Viejo	μg/m³	Maximum 24-hour concentration	Federal	35	46.6	32.6	22.6	3	0	0
	μg/m³	Annual concentration	State	12	ND	ND	ND	N/A	N/A	N/A
			Federal	12.0	9.3	9.7	9.0	N/A	N/A	N/A

Sources: CARB 2023f, EPA 2023d.

Notes: ppm = parts per million; N/A = not available or applicable; μg/m³ = micrograms per cubic meter; ND = insufficient data available to determine the value.

Data taken from CARB iADAM (http://www.arb.ca.gov/adam) and EPA AirData (http://www.epa.gov/airdata/) represent the highest concentrations experienced over a given year.

Exceedances of federal and state standards are only shown for O_3 and particulate matter. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed federal or state standards during the years shown. There is no federal standard for 1-hour O_3, annual PM_{10}, or 24-hour SO_2, nor is there a state 24-hour standard for $PM_{2.5}$.

The Mission Viejo monitoring station is located 26081 Via Pera, Mission Viejo, California 92691.

The Anaheim monitoring station is located at 812 W. Vermont Street, Anaheim, California 92802.

The Los Angeles monitoring station is located at 7201 W. Westchester Parkway, Los Angeles, California 90045.

[a] Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored.

4.1.6 Air Quality Analyses

The following sections present the analyses for determining the changes to ambient air quality concentrations in the region of the proposed project. These analyses are comprised of a screening assessment to determine the worst-case emissions from construction of the proposed project (the most intensive period of air pollutant emissions). Cumulative multisource modeling assessments, which are used to analyze the proposed project plus nearby existing sources, is not proposed because the only air emission sources present are intended from construction.

4.1.6.1 Construction Impact Analysis

The screening analysis consists of evaluating modeled project emissions against the significant impact levels (SILs) established by the EPA to determine if a project's criteria air pollutant emissions are considered inconsequential in comparison to the NAAQS. If the SILs are not exceeded, then a project's impacts would be considered insignificant, and no further analysis would be required. For completeness, this analysis also evaluates project emissions to the CAAQS and NAAQS. Modeled concentrations are compared to the SILs in Table 4.1-14~~2~~. All maximum facility impacts occurred at the ambient boundary, and the estimated concentrations are all below the applicable SILs.

Table 4.1-1~~2~~4. Air Quality Impact Results – Significant Impact levels

Pollutant	Averaging Time	Project Maximum Concentration (µg/m³)	Class II SIL (µg/m³)
Nitrogen dioxide (NO_2)	1 hour	80.03	7.5
	Annual	7.05	1
Carbon monoxide (CO)	1 hour	425.40	2,000
	8 hours	119.01	500
Sulfur dioxide (SO_2)	1 hour	0.47	7.86
	3 hours	0.38	25
	24 hours	0.10	5
Course Particulate Matter (PM_{10})	24 hours	0.44	5
	Annual	0.19	1
Fine Particulate Matter ($PM_{2.5}$)	24 hours	0.25	1.2
	Annual	0.12	0.13~~3~~

Notes: CAAQS are not listed because the SIL does not apply to CAAQS. µg/m3 = micrograms per cubic meter; SIL = Significant Impact Level.

As shown in Table 4.1-1~~2~~4, the maximum concentrations related by the project would not exceed the SILs established by the EPA for CO, SO_2, PM_{10}, and $PM_{2.5}$. However, the SIL for NO_x would exceed during construction for both the 1-hour and annual averaging. Because the SIL was exceed for NO_x, maximum combined concentrations (modeled + background) are evaluated in Table 4.1-1~~3~~5.

Table 4.1-15~~3~~. Air Quality Impact Results – Ambient Air Quality Standards

Pollutant	Averaging Time	Project Maximum Concentration (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	Ambient Air Quality Standard (µg/m³)	
					CAAQS	NAAQS
Nitrogen dioxide (NO_2)	1 hour	80.03	95.94	175.97	339	N/A
	1 hour	80.03	95.94	175.97	N/A	188
	Annual	7.05	25.00	32.05	57	100
Carbon monoxide (CO)	1 hour	425.40	2,760	3,185.40	23,000	40,000
	8 hours	119.01	1,955	2,074.01	10,000	10,000

Table 4.1-15~~3~~. Air Quality Impact Results – Ambient Air Quality Standards

Pollutant	Averaging Time	Project Maximum Concentration (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	Ambient Air Quality Standard (µg/m³)	
					CAAQS	NAAQS
Sulfur dioxide (SO_2)[a]	1 hour	0.47	20.61	21.08	655	N/A
	24 hours	0.10	3.14	3.24	105	N/A
Course Particulate Matter (PM_{10})	24 hours	0.44	120.00	120.44	50	N/A
	Annual	0.19	23.90	24.09	20	N/A
Fine Particulate Matter ($PM_{2.5}$)	24 hours	0.25	54.40	54.65	—	35
	Annual	0.12	11.44	11.56	12	~~12~~9
Sulfate	24 hour	0.10	5.10	5.20	25	N/A
Lead	Rolling 3-month average	0.002	0.012	0.014	N/A	0.15
	30-day average	0.002	0.016	0.018	1.5	N/A

Notes: µg/m3 = micrograms per cubic meter; CAAQS = California Ambient Air Quality Standards; NAAQS = National Ambient Air Quality Standards; PM_{10} = particulate matter less than 10 microns; $PM_{2.5}$ = particulate matter less than 2.5 microns; N/A = not applicable or available.

[a] Results for SO_2 and CO are reported as the H1H even though the NAAQS allows other forms of compliance. Using the H1H is a more conservative approach.

As shown in Table 4.1-15~~3~~, the proposed project would not exceed the CAAQS for NAAQS after accounting for background concentrations for all criteria air pollutants except for PM_{10} CAAQS and $PM_{2.5}$ NAAQS. The exceedances for PM_{10} and $PM_{2.5}$ are due to the high level of background concentrations that already exceed the CAAQS and NAAQS. As shown in Table 4.1-14~~7~~, the project would not exceed the SIL for both the 24-hour and annual PM_{10} concentrations and $PM_{2.5}$ 24-hour and annual concentrations. Additionally, these emissions would be temporary and short-term construction-related emissions. Therefore, impacts would be **less than significant.**

4.1.6.2 Operational Impact Analysis

A BESS is a stationary equipment that receives electrical energy and then utilizes batteries to store that energy to supply electrical energy at a future time. Power released or captured by the proposed project will be transferred to and from the SDG&E Trabuco to Capistrano 138 kV transmission line via a loop-in generation transmission line that will interconnect to an SDG&E switchyard to be constructed within the project site. The project will consist of lithium-ion batteries, installed in racks and contained inside non-habitable enclosures; inverters; MV transformers; an SDG&E switchyard; a project substation; and other associated equipment. The project site would be monitored remotely and would only require periodic maintenance. Therefore, the proposed project would not result in regular on-site emissions during normal operation and emission concentrations are anticipated to be less than those from construction. Therefore, no operational modeling was conducted.

4.1.6.3 BESS Commissioning Impact Analysis

Commissioning of the project is not anticipated to have any additional impacts beyond what has been considered for operation or result in greater intensity of activity than construction, so a separate commissioning impact analysis is not provided.

4.1.6.4 Fumigation Analysis

The project is located approximately 4.5 miles (7.2 kilometers) from the nearest large body of water (Pacific Ocean). Shoreline fumigation analysis is not relevant more than 3 kilometers from a large body of water, so shoreline fumigation was not run. Inversion break-up fumigation was considered; however, the AERSCREEN model will only consider fumigation for point sources with release heights 10 meters or more above ground level. Because the project was modeled as volume line sources, an inversion-break up fumigation model cannot be run.

4.1.7 Laws, Ordinances, Regulations, and Statutes

The project applicant would ensure compliance with laws, ordinances, regulations, and statutes of all applicable federal, state, local and administering agencies pertaining to air quality issues.

4.1.7.1 Federal

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The EPA is responsible for implementing most aspects of the Clean Air Act, including setting NAAQS for major air pollutants; setting HAP standards; approving state attainment plans; setting motor vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric O_3 protection measures, and enforcement provisions. Under the Clean Air Act, NAAQS are established for the following criteria pollutants: O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for O_3, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O_3, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The Clean Air Act requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan that demonstrates how those areas will attain the NAAQS within mandated time frames.

4.1.7.2 State

In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the federal Clean Air Act, and regulating emissions from motor vehicles and consumer products.

CARB has established CAAQS, which are generally more restrictive than the NAAQS. As stated previously, an AAQS defines the maximum amount of a pollutant averaged over a specified period of time that can be present in outdoor air without harm to the public's health. For each pollutant, concentrations must be below the relevant CAAQS before a basin can attain the corresponding CAAQS. Air quality is considered "in attainment" if pollutant levels are continuously below the CAAQS and violate the standards no more than once each year. The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, and $PM_{2.5}$ and visibility-reducing particles are values that are not to be exceeded.

California Health and Safety Code Section 41700

Section 41700 of the Health and Safety Code states that a person shall not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any of those persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property. This section also applies to sources of objectionable odors.

4.1.7.3 Air Pollution Control District

While CARB is responsible for the regulation of mobile emissions sources within the state, local air quality management districts and air pollution control districts are responsible for enforcing standards and regulating stationary sources. SCAQMD is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in the SCAB, where the project is located. SCAQMD operates monitoring stations in the SCAB, develops rules and regulations for stationary sources and equipment, prepares emissions inventory and air quality management planning documents, and conducts source testing and inspections. SCAQMD's Air Quality Management Plan (AQMP) includes control measures and strategies to be implemented to attain the CAAQS and NAAQS in the SCAB. SCAQMD then implements these control measures as regulations to control or reduce criteria pollutant emissions from stationary sources or equipment.

The 2022 AQMP was adopted on December 2, 2022, and was developed to address the 2015 national ozone standard. The 2022 AQMP provides the regional path towards improving air quality and meeting federal standards for air pollutants. The 2022 AQMP builds upon measures already in place from previous AQMPs. It also includes a variety of additional strategies such as regulation, accelerated deployment of available cleaner technologies (e.g., zero emissions technologies, when cost-effective and feasible, and low NO_x technologies in other applications), best management practices, co-benefits from existing programs (e.g., climate and energy efficiency), incentives, and other Clean Air Act measures to achieve the 2015 federal ozone standard (SCAQMD 2022a).

Applicable Rules

Emissions that would result from project construction may be subject to SCAQMD rules and regulations, which may include the following.

Rule 401 – Visible Emissions. This rule establishes the limit for visible emissions from stationary sources for a period or periods aggregating more than 3 minutes in any hour. This rule prohibits visible emissions dark or darker than Ringelmann No. 1 for periods greater than 3 minutes in any hour or such opacity which could obscure an observer's view to a degree equal or greater than does smoke.

Rule 402 – Nuisance. This rule prohibits the discharge of air pollutants from a facility that cause injury, detriment, nuisance, or annoyance to the public or damage to business or property.

Rule 403 – Fugitive Dust. This rule requires fugitive dust sources to implement best available control measures for all sources and prohibits all forms of visible particulate matter from crossing any property line. SCAQMD Rule 403 is intended to reduce PM_{10} emissions from any transportation, handling, construction, or storage activity that has the potential to generate fugitive dust.

Rule 431.2 – Sulfur Content of Liquid Fuels. The purpose of this rule is to limit the sulfur content in diesel and other liquid fuels for the purpose both of reducing the formation of SO_x and particulates during combustion and of enabling the use of add-on control devices for diesel-fueled internal combustion engines. The rule applies to all refiners, importers, and other fuel suppliers such as distributors, marketers, and retailers, as well as to users of diesel, low-sulfur diesel, and other liquid fuels for stationary-source applications in the SCAQMD. The rule also affects diesel fuel supplied for mobile source applications.

Rule 1113 – Architectural Coatings. This rule requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories.

4.1.7.4 Agency Jurisdiction and Contacts

No agencies were contacted directly to specifically discuss air quality impacts related to the proposed project.

4.1.7.5 Permit Requirements and Schedules

See Section 4.1.2, Regulatory Items Affecting New Source Review for a description of the permitting requirements and schedules.

4.1.8 References

CARB (California Air Resources Board). 2016. “Ambient Air Quality Standards.” May 5, 2016. Accessed October 2023. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

CARB. 2017. Inhalable Particulate Matter and Health ($PM_{2.5}$ and PM_{10}). https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health

CARB. 2023a. “Glossary.” Accessed October 2023. https://ww2.arb.ca.gov/glossary.

CARB. 2023b. “Ozone & Health.” Accessed October 2023. https://ww2.arb.ca.gov/resources/ozone-and-health.

CARB. 2023c. “Nitrogen Dioxide & Health.” Accessed October 2023. https://ww2.arb.ca.gov/resources/nitrogen-dioxide-and-health.

CARB. 2023d. “Carbon Monoxide & Health.” Accessed October 2023. https://ww2.arb.ca.gov/resources/carbon-monoxide-and-health.

CARB. 2023e. “Sulfur Dioxide & Health.” Accessed October 2023. https://ww2.arb.ca.gov/resources/sulfur-dioxide-and-health.

CARB. 2023f. “iADAM: Air Quality Data Statistics.” Accessed October 2023. http://arb.ca.gov/adam.

EPA (U.S. Environmental Protection Agency). 2023a. "Who Has to Obtain a Title V Permit?" EPA, Title V Operating Permits. May 2023. https://www.epa.gov/title-v-operating-permits/who-has-obtain-title-v-permit.

EPA. 2023b. *AERMOD Implementation Guide*. EPA-454/B-23-009. October 2023. https://gaftp.epa.gov/Air/aqmg/SCRAM/models/preferred/aermod/aermod_implementation_guide.pdf

EPA. 2023c. "Criteria Air Pollutants." November 17, 2020. https://www.epa.gov/criteria-air-pollutants.

EPA. 2023d. AirData: Access to Air Pollution Data." Last updated October,13, 2023. Accessed November 2023. http://www.epa.gov/airdata/ad_rep_mon.html.

NRC (National Research Council). 2005. *Interim Report of the Committee on Changes in New Source Review Programs for Stationary Sources of Air Pollutants*. Washington, D.C.: The National Academies Press. Accessed November 2023. https://doi.org/10.17226/11208.

SCAQMD (South Coast Air Quality Management District). 1993. *CEQA Air Quality Handbook*.

SCAQMD. 2008. *Final Localized Significance Threshold Methodology*. Revised July 2008. Accessed November 2023. http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf?sfvrsn=2.

SCAQMD. 2011. "Fact Sheet for Applying CalEEmod to Localized Significance Thresholds." http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/caleemod-guidance.pdf?sfvrsn=2.

SCAQMD. 2016. "National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for South Coast Air Basin." Accessed November 2023. https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf?sfvrsn=14.

SCAQMD. 2017. *Final 2016 Air Quality Management Plan*. March 2017. Accessed March 2020. http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf.

SCAQMD. 2022a. *2022 Air Quality Management Plan*. Adopted December 2, 2022. http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16.

SCAQMD. 2022b. Best Available Control Technology Guidelines for Non-Major Polluting Facilities. September 2nd 2022. http://www.aqmd.gov/docs/default-source/bact/bact-guidelines/bact-guidelines-2022/part-d---bact-guidelines-for-non-major-polluting-facilities.pdf?sfvrsn=8

SCAQMD. n.d.. "SCAQMD Modeling Guidance for AERMOD." Accessed November 2023. https://www.aqmd.gov/home/air-quality/meteorological-data/modeling-guidance#TOP.

SCAQMD 2023. South Coast AQMD Air Quality Significance Thresholds. March 2023. https://www.aqmd.gov/docs/default-source/ceqa/handbook/south-coast-aqmd-air-quality-significance-thresholds.pdf?sfvrsn=25

SJVAPCD (San Joaquin Valley Air Pollution Control District). 2018. "APR 2030 Project Ambient Air Quality Analysis Applicability Determination Under CEQA." June 12, 2018. https://ww2.valleyair.org/media/bo3hz35n/apr-2030.pdf.

INTENTIONALLY LEFT BLANK