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5.7 Air Quality

The section presents the air quality impact assessment for to the Vaca Dixon Power Center Project (Project). This section relies on information from the Air Quality and Greenhouse Gas Emissions Study prepared for the Project (Rincon 2025; Appendix R). Section 5.7.1 describes the existing air quality setting, including local air quality and sensitive receptors. Section 5.7.2 provides an overview of the regulatory setting related to air quality. Section 5.7.3 identifies potential impacts that may result from Project construction and operation (including maintenance), as well as mitigation measures that should be considered during Project construction and operation. Section 5.7.4 discusses cumulative impacts. Section 5.7.5 presents laws, ordinances, regulations, and standards (LORS) applicable to air quality. Section 5.7.6 identifies regulatory agency contacts. Section 5.7.7 describes permits required for the Project related to air quality. Section 5.7.8 provides references for this section.

5.7.1 Environmental Setting

The following subsections provide an overview of the existing environmental setting for air quality in the Project vicinity. The Project is located in unincorporated Solano County and in the City of Vacaville, within the Sacramento Valley Air Basin (SVAB).

The United States Environmental Protection Agency (USEPA) has identified criteria air pollutants that are a threat to public health and welfare. These pollutants are called "criteria" air pollutants because standards have been established for each of them to meet specific public health and welfare standards. Criteria pollutants that are a concern in the SVAB are described below.

5.7.1.1 Criteria Pollutants

Ozone

Ozone is a highly oxidative unstable gas produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NO_X) and reactive organic gases (ROG)/volatile organic compounds (VOC).[1] ROG is composed of non-methane hydrocarbons (with specific exclusions), and NO_X is composed of different chemical combinations of nitrogen and oxygen, mainly nitric oxide and nitrogen dioxide (NO_2). NO_X is formed during the combustion of fuels, while ROG is formed during the combustion and evaporation of organic solvents. As a highly reactive molecule, ozone readily combines with many different atmosphere components. Consequently, high ozone levels tend to exist only while high ROG and NO_X levels are present to sustain the ozone formation process. Once the precursors have been depleted, ozone levels rapidly decline. Because these reactions occur on a regional rather than local scale, ozone is considered a regional pollutant. In addition, because ozone requires sunlight to form, it mainly occurs in concentrations considered serious between May and October. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors. Depending on the level of exposure, ozone can cause coughing and a sore or scratchy throat; make it more difficult to breathe deeply and vigorously and cause pain when taking a deep breath; inflame and damage the airways; make

[1] The California Air Resources Board defines VOC and ROG similarly as, "any compound of carbon excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate," (40 Code of Federal Regulations 51.100) with the exception that VOC are compounds that participate in atmospheric photochemical reactions. For the purposes of this analysis, ROG and VOC are considered comparable in terms of mass emissions, and the term ROG is used in this document.

the lungs more susceptible to infection; and aggravate lung diseases such as asthma, emphysema, and chronic bronchitis (USEPA 2024a).

Nitrogen Dioxide

NO_2 is a by-product of fuel combustion. The primary sources are motor vehicles and industrial boilers, and furnaces. The principal form of NO_X produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO_2, creating the mixture of NO and NO_2, commonly called NO_X. NO_2 is a reactive, oxidizing gas and an acute irritant capable of damaging cell linings in the respiratory tract. Breathing air with a high concentration of NO_2 can irritate airways in the human respiratory system. Such exposures over short periods can aggravate respiratory diseases leading to respiratory symptoms (such as coughing, wheezing, or difficulty breathing), hospital admissions, and visits to emergency rooms. Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma and children and the elderly are generally at greater risk for the health effects of NO_2 (USEPA 2024b). NO_2 absorbs blue light and causes a reddish-brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of ozone/smog and acid rain.

Carbon Monoxide

Carbon monoxide (CO) is a localized pollutant found in high concentrations only near its source. The primary source of CO, a colorless, odorless, poisonous gas, is automobile traffic's incomplete combustion of petroleum fuels. Therefore, elevated concentrations are usually only found near areas of high traffic volumes. Other sources of CO include the incomplete combustion of petroleum fuels at power plants and fuel combustion from wood stoves and fireplaces during the winter. When CO levels are elevated outdoors, they can be of particular concern for people with some types of heart disease. These people already have a reduced ability to get oxygenated blood to their hearts in situations where they need more oxygen than usual. As a result, they are especially vulnerable to the effects of CO when exercising or under increased stress. In these situations, short-term exposure to elevated CO may result in reduced oxygen to the heart accompanied by chest pain, also known as angina (USEPA 2024c).

Particulate Matter

Particulates less than 10 microns in diameter (PM_{10}) and less than 2.5 microns in diameter ($PM_{2.5}$) are comprised of finely divided solids and liquids such as dust, soot, aerosols, fumes, and mists. Both PM_{10} and $PM_{2.5}$ are emitted into the atmosphere as by-products of fuel combustion and wind erosion of soil and unpaved roads. The atmosphere, through chemical reactions, can form particulate matter. The characteristics, sources, and potential health effects of PM_{10} and $PM_{2.5}$ can be very different. PM_{10} is generally associated with dust mobilized by wind and vehicles. In contrast, $PM_{2.5}$ is generally associated with combustion processes and formation in the atmosphere as a secondary pollutant through chemical reactions. PM_{10} can cause increased respiratory disease, lung damage, cancer, premature death, reduced visibility, and surface soiling. For $PM_{2.5}$, short-term exposures (up to 24-hours 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 (California Air Resource Board [CARB] 2023).

Sulfur Dioxide

Sulfur dioxide (SO_2) is included in a group of highly reactive gases known as "oxides of sulfur." The largest sources of SO_2 emissions are from fossil fuel combustion at power plants (73 percent) and other industrial facilities (20 percent). Smaller sources of SO_2 emissions include industrial processes such as extracting metal from ore and burning fuels with a high sulfur content by locomotives, large ships, and off-road equipment. Short-term exposures to SO_2 can harm the human respiratory system and make breathing difficult. People with asthma, particularly children, are sensitive to these effects of SO_2 (USEPA 2024d).

Lead

Lead (Pb) is a metal found naturally in the environment, as well as in manufacturing products. The major sources of Pb emissions historically have been mobile and industrial. However, due to the USEPA's regulatory efforts to remove lead from gasoline, atmospheric Pb concentrations have declined substantially over the past several decades. The most dramatic reductions in Pb emissions occurred before 1990 due to the removal of Pb from gasoline sold for most highway vehicles. Pb emissions were further reduced substantially between 1990 and 2008, with reductions occurring in the metals industries at least partly due to national emissions standards for hazardous air pollutants (USEPA 2014). As a result of phasing out leaded gasoline, metal processing is currently the primary source of Pb emissions. The highest Pb level in the air is generally found near Pb smelters. Other stationary sources include waste incinerators, utilities, and Pb-acid battery manufacturers. Pb can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and cardiovascular system depending on exposure. Pb exposure also affects the oxygen-carrying capacity of the blood. The Pb effects most likely encountered in current populations are neurological in children. Infants and young children are susceptible to Pb exposures, contributing to behavioral problems, learning deficits, and lowered intelligence quotient (USEPA 2024e).

5.7.1.2 Toxic Air Contaminants

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TAC) are a diverse group of airborne substances that may cause or contribute to an increase in deaths or serious illness, or that may pose a present or potential hazard to human health. TACs include both organic and inorganic chemical substances that may be emitted from a variety of common sources, including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. One of the main sources of TACs in California is diesel engine exhaust that contains solid material known as diesel particulate matter (DPM). More than 90 percent of DPM is less than one micron in diameter (about 1/70th the diameter of a human hair) and thus is a subset of $PM_{2.5}$. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lungs (CARB 2023).

TACs are different than criteria pollutants because ambient air quality standards have not been established for TACs. TACs occurring at extremely low levels may still cause health effects and it is typically difficult to identify levels of exposure that do not produce adverse health effects. TAC impacts are described by carcinogenic risk and by chronic (i.e., long duration) and acute (i.e., severe but of short duration) adverse effects on human health. People exposed to TACs at sufficient concentrations and durations may have an increased chance of getting cancer or experiencing other serious health effects. These health effects can include asthma, respiratory symptoms, and decreased lung functions (USEPA 2024f).

5.7.1.3 Background Air Quality

Ambient Air Quality Standards

The federal Clean Air Act (CAA) and the California Clean Air Act (CCAA) establish ambient air quality standards and establish regulatory authorities designated to attain those standards. As required by the CAA, the USEPA has identified criteria pollutants and has established National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. NAAQS have been established for ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and Pb. Under the CCAA, California has adopted the California Ambient Air Quality Standards (CAAQS), which are more stringent than the NAAQS for certain pollutants and averaging periods. Table 5.7-1presents the current federal and state standards for regulated pollutants and the SVAB's attainment status for each standard. California has also established CAAQS for sulfates, hydrogen sulfide, and vinyl chloride.

As required by the federal CAA and the CCAA, air basins or portions thereof have been classified as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether the standards have been achieved. In some cases, an area's status is unable to be determined, in which case the area is designated "unclassified". The air quality in an attainment area meets or is better than the NAAQS or CAAQS. A non-attainment area has air quality that is worse than the NAAQS or CAAQS. States are required to adopt enforceable plans, known as a State Implementation Plan (SIP), to achieve and maintain air quality meeting the NAAQS. As shown in Table 5.7-1, the SVAB currently is classified as nonattainment for the one-hour state ozone standard as well as for the federal and state eight-hour ozone standards. The SVAB is also designated as nonattainment for the federal 24-hour $PM_{2.5}$ standards. Additionally, the SVAB is classified as nonattainment for the state 24-hour and annual arithmetic mean PM_{10} standards. The SVAB is unclassified or classified as attainment for all other pollutant standards.

Table 5.7-1 Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard		National Standard	
		Concentration	SVAB Attainment Status	Concentration	SVAB Attainment Status
Ozone	8-Hour	0.070 ppm	Nonattainment	0.070 ppm	Nonattainment
	1-Hour	0.090 ppm		–	
Carbon Monoxide (CO)	1-Hour	9.0 ppm	Attainment	9.0 ppm	Attainment/ Unclassified
	8-Hour	20 ppm		35 ppm	
Nitrogen Dioxide (NO_2)	1-Hour	0.180 ppm	Attainment	0.100 ppm	Attainment
	Annual	0.030 ppm		0.053 ppm	
Sulfur Dioxide (SO_2)	1-Hour	0.25 ppm	Attainment	0.075 ppm	Attainment
	3-Hour	–		0.5 ppm	
	24-Hour	0.04 ppm		0.14 ppm	
	Annual	–		0.03 ppm	
Respirable Particulate Matter (PM_{10})	24-Hour	50 mg/m^3	Nonattainment	150 mg/m^3	Unclassified
	Annual	20 mg/m^3		–	
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	–	Unclassified	35 mg/m^3	Nonattainment
	Annual	12 mg/m^3	Unclassified	9 mg/m^3	Attainment
Lead (Pb)	30-Day	1.5 mg/m^3	Attainment	–	Attainment
	Quarterly	–		1.5 mg/m^3	

ppm = parts per million; ppb = parts per billion; µg/m3 = micrograms per cubic meter

Source: Yolo-Solano Air Quality Management District (YSAQMD) 2024a, USEPA 2024g

Existing Ambient Air Quality

The Yolo-Solano Air Quality Management District (YSAQMD) monitors ambient air quality to protect public health and comply with federal and state requirements. YSAQMD's monitoring network provides real-time data that allows the YSAQMD to forecast air quality and issues advisories to the public as needed. The monitoring network also allows the YSAQMD to show progress toward air quality standards. There are six permanent monitoring sites within Yolo-Solano. The nearest monitoring station to the Project is the Vacaville-Ulatis Drive monitoring station, at 2012 Ulatis Drive in the City of Vacaville, approximately 3.1 miles southwest of the Project. This monitoring station measures only ozone. PM_{10} measurements near the Project site were obtained from the Vacaville-Merchant Street monitoring station, located at 650 Merchant Street in Vacaville, approximately 4.9 miles southwest of the Project. The closest monitoring station for NO_2 and $PM_{2.5}$ data is the Vallejo-304 Tuolumne Street monitoring station, located at 304 Tuolumne Street in Vallejo, approximately 27 miles southwest of the Project.

Table 5.7-2 indicates the number of days each federal and state standard was exceeded at these stations for their respective pollutants for the most recent three years for which data is available. As shown therein, $PM_{2.5}$ measurements exceeded standards in 2023. No other state or federal standards were exceeded at these monitoring stations. Since CO and SO_2 are in attainment with the SVAB region, they are not monitored at any of the six air monitoring stations. Therefore, ambient air quality is not reported for these pollutants.

Table 5.7-2 Ambient Air Quality at the Nearest Monitoring Station, 2022-2024

Pollutant	2022	2023	2024
Ozone			
8 Hour Ozone (ppm), 8-Hr Maximum	0.068	0.069	0.064
Number of Days of State exceedances (>0.070)	0	0	0
Number of days of Federal exceedances (>0.070)	0	0	0
Ozone (ppm), Worst Hour	0.086	0.075	0.070
Number of days above State standard (>0.09 ppm)	0	0	0
Respirable Particulate Matter, PM_{10}			
Particulate Matter 10 microns, mg/m3, Worst 24 Hours	35	38	26
Number of days above State standard (>50 µg/m³)	0	0	0
Number of days above Federal standard (>150 µg/m³)	0	0	0
Fine Particulate Matter, $PM_{2.5}$			
Particulate Matter <2.5 microns, mg/m3, Worst 24 Hours	31	36	13
Number of days above Federal standard (>35 µg/m³)	0	1	0
Nitrogen Dioxide, NO_2			
Nitrogen Dioxide (ppb), Worst Hour	26.8	22.5	25.0
Number of days above State standard (>180 ppb)	0	0	0
Number of days above Federal standard (>100 ppb)	0	0	0

µg/m³ = micrograms per cubic meter; ppb = parts per billion

Source: Appendix C of Appendix R, CARB 2024

5.7.1.4 Climate and Meteorology

The Project site is in unincorporated Solano County and in the City of Vacaville. The site is located within the SVAB and is under the jurisdiction of the YSAQMD. The SVAB encompasses eleven counties including all of Shasta, Tehama, Glenn, Colusa, Butte, Sutter, Yuba, Sacramento, and Yolo Counties, the westernmost portion of Placer County and the northeastern half of Solano County. The SVAB is bounded by the North Coast Ranges on the west and Northern Sierra Nevada Mountains on the east. The intervening terrain is relatively flat.

Hot dry summers and mild rainy winters characterize the Mediterranean climate of the SVAB. During the year the temperature may range from 20 to 115 degrees Fahrenheit with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is about 20 inches, and the rainy season generally occurs from November through March. The prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north.

The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells collect over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions that trap pollutants near the ground.

The ozone season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds with the delta sea breeze arriving in the afternoon out of the southwest. Usually, the evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. During about half of the days from July to September, however, a phenomenon called the "Schultz Eddy" prevents this from occurring. Instead of allowing the prevailing wind patterns to move north carrying the pollutants out, the Schultz Eddy causes the wind pattern to circle back to the south. Essentially, this phenomenon causes the air pollutants to be blown south toward the YSAQMD basin. This phenomenon has the effect of exacerbating the pollution levels in the area and increases the likelihood of violating federal or state standards. The eddy normally dissipates around noon when the delta sea breeze arrives (YSAQMD 2007).

5.7.2 Regulatory Setting

A review of existing relevant LORS was conducted to understand the regulatory context of air quality surrounding the Project. These are detailed in Section 5.7.5.

5.7.3 Impact Analysis

The following subsections discuss the potential direct and indirect impacts related to air quality from construction and operation and maintenance (O&M) of the Project.

5.7.3.1 Methodology

This section presents the methodology used for the analysis of construction, operational, and decommissioning emissions for the Project. Criteria pollutant and greenhouse gas (GHG) emissions for Project construction and operation were calculated using the California Emissions Estimator Model (CalEEMod), Version 2022.1. CalEEMod is a statewide land use emissions computer model

designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operations from a variety of land use projects. CalEEMod allows for the use of default data (e.g., emission factors, trip lengths, meteorology, source inventory) provided by the various California air districts to account for local requirements and conditions, and/or user-defined inputs. The calculation methodology and input data used in CalEEMod can be found in the CalEEMod User's Guide Appendices A, D, and E. The input data and construction and operation emission estimates for the Project are discussed below and provided in Appendix A of Appendix R. Emissions calculations made outside CalEEMod, such as those related to air dispersion modeling refinements or other post-processing tasks are included in Appendix C of Appendix R. CalEEMod output files for the Project are included in Appendix B of Appendix R. The estimated emissions were then compared to applicable significance criteria and reported below in the applicable impact discussions.

Construction Emissions

Construction emissions of criteria air pollutants include emissions generated by construction equipment used on-site and emissions generated by vehicle trips associated with construction, such as worker and vendor trips. CalEEMod estimates construction emissions by multiplying the amount of time equipment is in operation by emission factors.

The Vaca Dixon 57 MWh Battery Energy Storage System (BESS) component would be located on approximately 4.25 acres in the southwestern portion of the Project site. The Arges 400 MWh BESS component would be located on approximately 5.75 acres in the northern and southeastern portions of the Project site. It is currently planned that the Vaca Dixon 57 MWh and Arges 400 MWh components would be constructed sequentially.

Each piece of construction equipment was estimated to operate approximately 8 hours per day, six days per week, and used fleet information provided by the Applicant and the CalEEMod defaults for horsepower and load factor. Gen-tie installation would require the use of one light-duty helicopter for approximately two hours total on one day during each conductor stringing operation with one for Vaca Dixon 57 MWh BESS and one for Arges 400 MWh BESS. Mobile trips were based on information provided by the Applicant and using CalEEMod default fleet mixes and trip lengths. This analysis assumes that the Project would comply with all applicable regulatory standards. Fugitive dust minimization assumptions were implemented in the model, including that watering would occur twice per day.

Detailed assumptions including schedule and phasing for each construction scenario are included in Appendix A of Appendix R. Table 5.7-3 below includes the anticipated construction phases and dates for each of the construction scenarios.

Table 5.7-3 Construction Schedule

	Vaca Dixon			Arges		
Phase	**Start**	**End**	**Days**	**Start**	**End**	**Days**
Access Road	7/1/2027	7/29/2027	25	6/1/2028	6/29/2028	25
Site Preparation	7/30/2027	10/22/2027	73	6/30/2028	9/22/2028	73
Grading	Included in site preparation			Included in site preparation		
Installation of Foundations and Equipment	10/23/2027	12/18/2027	49	9/23/2028	11/18/2028	49
Set Modules, Inverters, and Switchgear	12/19/2027	2/13/2028	48	11/19/2028	1/14/2029	48
Electrical Wire Installation/Finish Grading	2/14/2028	4/10/2028	49	1/15/2029	3/12/2029	49
Commissioning and Testing	4/11/2028	7/4/2028	73	3/13/2029	6/5/2029	73

Operational Emissions

In CalEEMod, operational sources of criteria pollutant emissions include area, energy, and mobile sources. The first year of operation was assumed to be 2028 for Vaca Dixon 57 MWh BESS and 2029 for Arges 400 MWh BESS. The facilities were modeled as refrigerated warehouses of 36,771 square feet for Vaca Dixon 57 MWh BESS and 65,718 square feet for Arges 400 MWh BESS to account for the energy requirements for maintaining a stable temperature for optimum battery effectiveness, although this energy consumption is anticipated to be offset by the power stored and discharged at the site. Water consumption is assumed for landscaping purposes. The Project would include approximately 24,000 square feet of landscaped area. No solid waste generation is anticipated and no other water emissions sources are associated with the Project since it would be typically unmanned and would require only limited maintenance equipment.[2] The facilities would require periodic maintenance visits where one or two workers would perform routine maintenance on the facilities twice a week. The trip rate was adjusted to reflect 416 annual trips per year (or two trips per week) each for Vaca Dixon 57 MWh BESS and Arges 400 MWh BESS. Augmentation involving addition of batteries to compensate for degraded battery output would be required. It is anticipated that modules would need to be added every 2-5 years for upgrades or augmentation. It is assumed that these operational activities would be similar to construction activities for the "Set Modules, Inverters, and Switchgear" phases, so the emissions calculated for this phase of construction has been conservatively applied to this operational activity. Area source emissions would include periodic re-coating of battery containers.

California Energy Commissions (CEC) Appendix B Item (E) GHG requires "[t]he emission rates of criteria pollutants and greenhouse gases (Carbon Dioxide, Methane, Nitrous oxide, and SF_6) from the stack, cooling towers, fuels and materials handling processes, delivery and storage systems, and from all on-site secondary emission sources." The Project does not include stacks, cooling towers, fuels and materials handling processes or delivery and storage systems. The on-site emissions sources are from the on-site use of off-road construction equipment as well as building operations and employee vehicle trips. Emission factors for off-road construction equipment, building emissions, and employee vehicle commutes are imbedded in the CalEEMod model.

[2] Area sources are widely distributed and include such sources as residential and commercial water heaters, painting operations, lawn mowers, agricultural fields, landfills, and some consumer products. With respect to the Project, area sources refer to consumer products (such as aerosol cleaners), and architectural coating (maintenance re-coating activities for battery storage).

SF_6 Emissions

During operation and maintenance of the Arges 400 MWh BESS component, one of the main sources of GHG emissions would be refrigerants for battery cooling and fugitive emissions from equipment containing SF_6 gas installed at the switchyard. Circuit breakers contain SF_6; however, new circuit breaker designs have been developed over the past several years to minimize the potential for leakage, compared to that of past designs (CARB 2020). In addition, the equipment would comply with CARB's Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear regulations (CARB 2025). The Project would maintain a total of 100 pounds (lbs.) of SF_6 gas during operation. Although leakage is unlikely, for the purposes of the Project's emissions inventory, it was assumed that the breakers would have a maximum annual leak rate of 0.5 percent in accordance with the Institute of Electrical and Electronics (Institute of Electrical and Electronics 2018). Detailed assumptions including annual SF_6 gas are included in Appendix A of Appendix R.

Project Decommissioning

At the end of the Projects' useful life (anticipated to be 35 years or more), the BESS facilities would be decommissioned. Activities required for deconstruction of the on-site facilities would require similar types and levels of equipment to those used during the construction phase. Equipment is likely to have lower emissions due to cleaner equipment fleets available at the time of decommissioning. Therefore, decommissioning was not modeled separately and is conservatively assumed to be consistent with construction emissions estimates.

Ambient Air Quality Analysis

A localized ambient air quality analysis (AAQA) following the YSAQMD's modeling guidance documents was conducted to assess the potential impacts of construction and operational activities. Daily and annual emissions burdens were estimated for the duration of the construction period based on provided construction schedule, number of pieces of construction equipment, horsepower rating of construction equipment, utilization of construction equipment, engine exhaust certifications, and construction activities as modeled. Refined air dispersion modeling of the daily emissions was conducted using AMS/EPA Regulatory Model (AERMOD) to show the Project's maximum localized impacts from pollutants are below the ambient air quality standards. Emissions in AERMOD were set to 1 gram per second (g/sec), and emissions were scaled in a stand-alone spreadsheet to account for actual Project emissions. The exception was for NO_2 modeling, which implemented AERMOD's Tier 2 NO_X/NO_2 conversion algorithms; actual Project emissions were input into a separate model run. Helicopter emissions were modeled as occurring during all active construction hours, rather than just two hours per day, to provide a conservative estimate of pollutant exposure.

Only the maximum localized pollutant levels related to on-site construction activities were estimated and verified through AERMOD modeling. Emissions from construction equipment and helicopters were modeled as poly-area sources and mobile source trips as line volume sources to simulate construction activities. The highest combined emissions for the Vaca Dixon 57 MWh BESS and Arges 400 MWh BESS components were evaluated during the overlapping site preparation and grading phases, as well as the electrical wire installation/finish grading phase, which includes helicopter use. These emissions were used for the AAQA.

To account for the impact of localized pollutants in combination with pollution from other sources, the modeled results were added to the background level as recommended by USEPA. Unique background levels are based on the specific details of the applicable standards and based on nearby

air monitoring data. The resulting pollutant concentrations (modeled result and background) were then compared to the applicable NAAQS and CAAQS. Dispersion modeling parameters and the receptor grid were consistent with those used for the health risk assessment.

Methodology for Determining Health Risks

Health impacts associated with TACs are generally from long-term exposure. Typical sources of TACs include industrial processes such as petroleum refining operations, commercial operations such as gasoline stations and dry cleaners, and diesel exhaust. Health impacts from TAC emissions during the operational phase of the Project could result from the use of on-site diesel equipment during Project operation. In addition, the use of large-scale off-road diesel equipment during Project construction may result in a short-term increase of TAC emissions. DPM would be the TAC emitted in the largest quantity during construction and is the primary contaminant of concern for the Project.

CARB's Air Quality and Land Use Handbook: A Community Health Perspective (April 2005) recommends against siting sensitive receptors within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day. While these siting distances are not particular to construction activities, the primary source of TAC emissions from both freeways and construction equipment is DPM. Therefore, for projects within 1,000 feet of sensitive receptors, a refined health risk would be conducted. The nearest sensitive receptor is approximately 750 feet away. As such, health risks were assessed quantitatively. Dispersion modeling parameters and the receptor grid were consistent with those used for the AAQA.

Generation of DPM from construction projects typically occurs in a single area for a short period of time. Construction of the Project would occur over a period of approximately 2 years. The dose to which the receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and the extent of exposure that person has with the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the Maximally Exposed Individual (MEI). The risks estimated for an MEI are higher if a fixed exposure occurs over a longer period of time. According to the California Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period and duration of activities associated with the Project. Thus, the duration of proposed construction activities (i.e., 24 months) is approximately seven percent of the total exposure period used for 30-year health risk calculations.

In addition, the Project would comply with the CARB Air Toxics Control Measure that limits diesel powered equipment and vehicle idling to no more than five minutes at a location, and the CARB In-Use Off-Road Diesel Vehicle Regulation; compliance with these requirements would minimize emissions of TACs during construction.

5.7.3.2 Impact Evaluation Criteria

The air quality related impacts associated with the Project were evaluated using the criteria described in the California Environmental Quality Act (CEQA) Environmental Checklist (Appendix G of the CEQA Guidelines). For air quality, the CEQA Environmental Checklist asks, would the Project:

- Conflict with or obstruct implementation of the applicable air quality plan?
- Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard?
- Expose sensitive receptors to substantial pollutant concentrations?
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Annual Criteria Air Pollutant Emissions

Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) indicates that, where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied on to determine whether a project would have a significant impact on air quality. The YSAQMD recommends the use of quantitative thresholds to determine the significance of temporary construction-related pollutant emissions and long-term operational-related pollutant emissions. These thresholds are justified in the YSAQMD Handbook for Assessing and Mitigating Air Quality Impacts, adopted in 2007, and are shown in Table 5.7-4.

Table 5.7-4 YSAQMD Air Quality Significance Thresholds

Pollutant	Construction Threshold	Operation Threshold
NO_x	10 tons/year	10 tons/year
ROG[1]	10 tons/year	10 tons/year
PM_{10}	80 lbs/day	80 lbs/day
$PM_{2.5}$	n/a	n/a
SO_X	n/a	n/a
CO	Violation of a state ambient air quality standard for CO	

NO_X = oxides of nitrogen; ROG = reactive organic gases; PM_{10} = coarse particles of a diameter of 10 microns or less; $PM_{2.5}$ = fine particles of a diameter less than 2.5 microns; SO_X = sulfur oxide; CO = carbon monoxide

[1] ROG are formed during combustion and evaporation of organic solvents. ROG are also referred to as volatile organic compounds.

Source: Appendix B of Appendix R

Toxic Air Contaminants (TAC)

The YSAQMD threshold for TACs is based on a maximum incremental cancer risk greater than 10 in one million or ground-level concentrations of non-carcinogenic TACs of greater than a hazard index of 1.

Ambient Air Quality Analysis

An AAQA uses air dispersion modeling to determine if emission increases from a project's construction or operational activities would cause or contribute to a violation of the ambient air quality standards. If modeled concentrations combined with background concentrations would result in an exceedance of a NAAQS or CAAQS, then impacts would be significant.

Impact AQ-1

Threshold:	Would the Project conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant Impact. The YSAQMD has prepared several air quality attainment plans to achieve State and federal ozone and particulate matter standards. YSAQMD continuously monitors its progress in implementing attainment plans and must periodically report to CARB and the EPA. YSAQMD, in partnership with the five air districts in the Sacramento Metropolitan Area, CARB, and the Sacramento Area Council of Governments (SACOG), periodically revises its attainment plans to reflect new conditions and requirements in accordance with schedules mandated by the California and federal CAAs. YSAQMD requires a triennial assessment of the extent of air quality improvements and emissions reductions achieved with control measures. The most recent plan includes the *2023 Sacramento Regional 2015 NAAQS 8-Hour Ozone Attainment & Reasonable & Further Progress Plan.*

Strategies to achieve emissions reductions were developed in the 2015 NAAQS 8-hour O_3 Attainment Plan and the Sacramento Federal Nonattainment Area (SFNA) Exceptional Events Mitigation Plan for the region. Consistency with these plans is determined by analyzing a project's consistency with the assumptions in the plans. Thus, the emphasis of this discussion is to evaluate if the Project's land uses would be consistent with or less intensive than the emission forecasts for the defined Project Site contained in the plans. The growth forecasts used in the plans are developed by SACOG. SACOG forecasts are based on local general plans and other related documents that are used to develop population, employment, and traffic projections. The emissions inventory forecasts in the plans are based on the growth forecasts from the 2020 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTS/SCS).

Operation of the Project would not result in a substantial increase in employment and would only require two weekly trips by two existing employees to the Project Site. This would not induce population growth. Therefore, the Project would not increase the population of or the employment inventory, directly or indirectly, and the Project would not exceed the forecasts utilized in air quality plans. Furthermore, as detailed below under Impact AQ-2, the Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the SVAB is nonattainment under an applicable federal or state ambient air quality standard. In addition, the Project would comply with all existing and new rules and regulations as they are implemented by the YSAQMD, CARB, and/or the USEPA related to emissions generated during construction. Therefore, the Project would not conflict with or obstruct implementation of the 2015 NAAQS 8-hour O_3 Attainment Plan and SFNA Exceptional Events Mitigation Plan, and impacts would be less than significant.

Impact AQ-2

Threshold:	Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard?

Construction Impacts

Construction and Decommissioning Emissions

Project construction would generate air pollutant emissions from on-site equipment, entrained dust, off-road equipment uses, and vehicle emissions. Off-site emissions would be generated by construction worker daily commute trips and heavy-duty diesel haul truck trips. Construction of the Project would be conducted in two phases. It is assumed that Vaca Dixon 57 MWh BESS construction would precede Arges 400 MWh BESS construction; however, testing and commissioning for Vaca Dixon 57 MWh BESS would be conducted concurrently with initial Arges 400 MWh BESS construction activities. The decommissioning emissions would be similar or slightly less than the construction activities. All decommissioning activities would adhere to the requirements of the appropriate governing authorities and be conducted in accordance with all applicable federal, state, and county regulations.

Vaca Dixon 57 MWh BESS

Construction of the Vaca Dixon 57 MWh BESS component is anticipated to begin in July of 2027 and require approximately 12 months of construction activity. The specific construction equipment as well as estimated material import and export required to complete the Vaca Dixon 57 MWh BESS component is provided in Appendix A of Appendix R. Estimated construction emissions are provided in Table 5.7-5, below.

Table 5.7-5 Estimated Vaca Dixon 57 MWh BESS Construction Emissions

	Project Emissions					
Year	**ROG (tons/yr)**	**NO_x (tons/yr)**	**CO (tons/yr)**	**SO_x (tons/yr)**	**PM_{10} (lbs/day)**	**$PM_{2.5}$ (lbs/day)**
Phase 1						
2027	0.04	0.39	1.2	<0.005	48	6.2
2028	0.02	0.17	0.5	<0.005	22	2.3
Maximum Emissions Construction	**0.04**	**0.39**	**1.2**	**<0.005**	**48**	**6.17**
YSAQMD Screening Threshold	10	10	–	–	80	–
Exceed Threshold?	No	No	–	–	No	–

lbs./day = pounds per day; tons/yr = tons per year; ROG = reactive organic gases; NO_x = nitrogen oxide; CO = carbon monoxide; PM_{10} = particulate matter with a diameter no more than 10 microns; $PM_{2.5}$ = particulate matter with a diameter no more than 2.5 microns; SO_x = sulfur oxide; YSAQMD = Yolo-Solano Air Quality Management District.

Source: Appendix B of Appendix R.

Arges 400 MWh BESS

Construction of the Arges 400 MWh BESS component is anticipated to begin in June of 2028 and require approximately 12 months of construction activity. It is assumed that the construction periods for the Vaca Dixon 57 MWh and Arges 400 MWh BESS components would not overlap. The specific construction equipment as well as estimated material import and export required to complete the Arges 400 MWh BESS component is provided in Appendix A of Appendix R. Estimated construction emissions are provided in Table 5.7-6 below.

Table 5.7-6 Estimated Arges 400 MWh BESS Construction Emissions

	Project Emissions					
Year	ROG (tons/yr)	NO_X (tons/yr)	CO (tons/yr)	SO_x (tons/yr)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Phase 2						
2028	0.04	0.51	1.29	< 0.005	53.3	6.8
2029	0.02	0.16	0.43	< 0.005	22.1	2.37
Maximum Emissions Construction	**0.05**	**0.51**	**1.29**	**< 0.005**	**53.3**	**6.80**
YSAQMD Screening Threshold	10	10	–	–	80	–
Exceed Threshold?	No	No	–	–	No	–

lbs./day = pounds per day; tons/yr = tons per year; ROG = reactive organic gases; NO_x = nitrogen oxide; CO = carbon monoxide; PM_{10} = particulate matter with a diameter no more than 10 microns; $PM_{2.5}$ = particulate matter with a diameter no more than 2.5 microns; SO_x = sulfur oxide; YSAQMD = Yolo-Solano Air Quality Management District.

Source: Appendix B of Appendix R.

Decommissioning

The decommissioning of the Project is anticipated to require similar or fewer pieces of equipment, vehicles, and construction-related activities compared to initial construction. As a result, air quality emissions during decommissioning are expected to be similar or lower than those presented in Table 5.7-5 and Table 5.7-6.

Ambient Air Quality Analysis

An AAQA was performed in accordance with CCR Title 20, Division 2, Chapter 5, Article 6, Section B, Appendix B, (8)(I)(i) following the methodology as described above. The AAQA analyzed the overlapping site preparation and grading phases as well as the electrical wire installation and finish grading phases for the Vaca Dixon 57 MWh and Arges 400 MWh BESS components, which includes helicopter use. Table 5.7-7 presents the maximum daily criteria pollutant emissions resulting from these construction activities. As shown, unmitigated Project construction would not exceed the regional NAAQS or CAAQS ambient concentrations for either construction of the Vaca Dixon 57 MWh BESS or Arges 400 MWh BESS components of the Project. The AAQA demonstrates that Project construction emissions of criteria pollutants would not exceed the ambient air quality standards.

Table 5.7-7 Maximum Project Construction Ambient Air Quality Impact Assessment

Pollutant	Averaging Period	Background (ug/m³)	Project (ug/m³)	Project + Background (ug/m³)	AAQS (ug/m³)	Exceed?
NO_2	1Hr - NAAQS	46.6	49	96	188	No
	1Hr - CAAQS	46.6	74	121	339	No
	Annual - NAAQS	6.6	2.5	9.1	100	No
	Annual - CAAQS	6.6	2.5	9.1	57	No
CO	1Hr - NAAQS	7,065	552	7,616	40,000	No
	1Hr - CAAQS	7,065	552	7,616	23,000	No
	8Hr - NAAQS	3,170	120	3,290	10,000	No
	8Hr - CAAQS	3,170	120	3,290	10,000	No
PM_{10}	24Hr - NAAQS	33.0	7.2	40.3	150	No
	24Hr - CAAQS	33.0	9.0	42.1	50	No
	Annual - CAAQS	12.0	1.9	13.9	20	No
$PM_{2.5}$	24Hr - NAAQS	26.7	1.2	27.9	35	No
	Annual - NAAQS	7.8	0.7	8.4	12	No
	Annual - CAAQS	7.8	0.7	8.4	12	No
SO_2	1Hr - NAAQS	162.0	7.0	169	196	No
	1Hr - CAAQS	162.0	7.0	169	655	No

NO_2 = nitrogen dioxide, CO = carbon monoxide, SO_2 = sulfur dioxide, NAAQS = National Ambient Air Quality Standard
CAAQS = California Ambient Air Quality Standard, ug/m³ = micrograms per meter cubed

Decommissioning Impacts

Decommissioning activities at the end of the Project's useful life (anticipated to be 35 years) would completely remove all Project components from the Project Site. At this time, it is not possible to quantitatively evaluate potential air quality impacts that would result from Project decommissioning since technology and construction practices available at that time would be speculative. Therefore, based on current decommissioning practices and as a reasonable worst-case scenario, this analysis assumes that air quality impacts generated during future decommissioning would be similar to air quality impacts generated during the construction phase of the Project. Accordingly, similar to construction of the Project, the impacts of decommissioning activities on the Project Site would be less than significant.

Construction Impacts Summary

Less Than Significant. As shown above, construction and decommissioning of the Project would not result in emissions above the YSAQMD significance thresholds. Furthermore, as shown in Table 5.7-7, Project construction would not exceed the NAAQS or CAAQS ambient daily concentrations for criteria air pollutants for either phase of construction. Impacts would be less than significant.

Operational Impacts

Long-term emissions associated with operation of the Project would be primarily generated by weekly O&M visits. The Project would have the occasional need for battery upgrades or augmentation. These emissions would be similar to the "Set Modules, Inverters, and Switchgear"

construction phase. As a surrogate for battery augmentation and upgrades, the daily emissions from this construction activity were added to the operational emissions as a conservative estimate of emissions.[3] Annual emissions are based on 20 days or approximately one third of the initial construction schedule for each BESS component. Operation of the Project would result in negligible long-term emissions from vehicle trips, area source emissions[4], and periodic re-coating of battery containers, as shown in Table 5.7-8.

Estimated operational emissions are shown in Table 5.7-8. New operational emissions would not exceed applicable thresholds for criteria pollutants; therefore, Project operation would not violate any air quality standard, contribute substantially to an existing or projected air quality violation, or result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment under an applicable federal or state ambient air quality standard. Impacts would be less than significant.

Table 5.7-8 Annual Operational Emissions

	Project Emissions					
Source	ROG (tons/yr)	NO_X (tons/yr)	CO (tons/yr)	SO_x (tons/yr)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Vaca Dixon 57 MWh BESS						
Mobile	< 0.1	< 0.1	0.01	< 0.1	0.18	< 0.1
Area	0.18	< 0.1	0.14	< 0.1	< 0.1	< 0.1
Energy	< 0.1	0.01	0.01	< 0.1	< 0.1	< 0.1
Battery Ops & Upgrades	< 0.1	<0.1	0.02	<0.1	18.64	1.93
Arges 400 MWh BESS						
Mobile	< 0.1	< 0.1	< 0.1	< 0.1	0.18	< 0.1
Area	0.32	< 0.1	0.26	< 0.1	<0.1	< 0.1
Energy	< 0.1	0.02	0.01	< 0.1	0.1	0.1
Battery Ops & Upgrades	< 0.1	<0.1	0.03	<0.1	17.41	1.81
Total	**0.5**	**0.03**	**0.51**	**<0.1**	**36.43**	**3.79**
YSAQMD Screening Threshold	10	10	–	–	80	–
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

lbs./day = pounds per day; tons/yr = tons per year; ROG = reactive organic gases; NO_x = nitrogen oxide; CO = carbon monoxide; PM_{10} = particulate matter with a diameter no more than 10 microns; $PM_{2.5}$ = particulate matter with a diameter no more than 2.5 microns; SO_x = sulfur oxide; YSAQMD = Yolo-Solano Air Quality Management District.

Source: Appendix B of Appendix R.

Ambient Air Quality Impact Assessment

Operational activities would not exceed the YSAQMD's recommended significance thresholds. Emissions are minimal and would not contribute to an exceedance of an ambient air quality standard. Project operation would not contribute substantially to an existing or projected air quality violation.

[3] It is conservatively assumed that these operational activities are occurring for both Project components on the same day, even though they were constructed separately (and those emissions are being used as the basis).
[4] Area source emissions are associated with emissions of consumer products used for cleaning and landscaping emissions, And are conservatively included for this analysis

Operational Impacts Summary

Less Than Significant Impact. As shown above, operation of the Project would not exceed YSAQMD significance thresholds for any criteria pollutant. Therefore, this impact would be less than significant.

Overlapping Construction and Operational Emissions

Less Than Significant Impact. Vaca Dixon 57 MWh BESS construction is assumed to precede Arges 400 MWh BESS construction; however, testing and commissioning associated with Vaca Dixon 57 MWh BESS would be conducted concurrently with initial Arges 400 MWh BESS construction activities. Battery Ops & Upgrades operational activities associated with the Vaca Dixon 57 MWh BESS component would not occur until after completion of Arges 400 MWh BESS component construction. Based on the information provided in Table 5.7-9, any potential overlapping construction and operational activities would be less than significant.

Table 5.7-9 Estimated Overlapping Emissions

	Project Emissions					
Source	**ROG (tons/yr)**	**NO_X (tons/yr)**	**CO (tons/yr)**	**SO_x (tons/yr)**	**PM_{10} (lbs/day)**	**$PM_{2.5}$ (lbs/day)**
Maximum Vaca Dixon 57 MWh BESS Operations	0.18	0.01	0.17	0	0.18	0.02
Maximum Arges 400 MWh BESS Construction	0.04	0.51	1.29	0	53.30	6.8
Total	**0.22**	**0.52**	**1.46**	**0**	**53.5**	**6.8**
YSAQMD Screening Threshold	10	10	–	–	80	–
Exceed Threshold?	No	No	No	No	No	No

lbs./day = pounds per day; tons/yr = tons per year; ROG = reactive organic gases; NO_x = nitrogen oxide; CO = carbon monoxide; PM_{10} = particulate matter with a diameter no more than 10 microns; $PM_{2.5}$ = particulate matter with a diameter no more than 2.5 microns; SO_x = sulfur oxide; YSAQMD = Yolo-Solano Air Quality Management District.

Note: Battery Ops & Upgrades assumed not to overlap with Phase 2 construction activities.

Source: See Appendix B of Appendix R.

Impact AQ-3

Threshold:	Would the Project expose sensitive receptors to substantial pollutant concentrations?

Construction and Decommissioning

Less than Significant Impact. The greatest potential for TAC emissions during construction and decommissioning would be from heavy equipment operations that generate DPM emissions. Generation of DPM from construction projects typically occurs in a single area for a short period. Construction of the Project would require approximately 24 months between 2027 and 2029. As cancer risk is a long-term analysis, impacts from the Vaca Dixon 57 MWh and Arges 400 MWh BESS components of the overall Project are analyzed together.

Generation of DPM from construction/decommissioning typically occurs in a single area for a short period. The dose to which the receptors are exposed is the primary factor used to determine health risk. Dose is a function of the concentration of a substance or substances in the environment and

the extent of exposure that person has to the substance. Dose is positively correlated with time, and a more extended exposure period would result in a higher exposure level for the maximally exposed individual. The risks estimated for a Maximally Exposed Individual are higher if a fixed exposure occurs over a more extended period. According to the California Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to toxic emissions, should be based on a 30-year exposure period. However, such assessments should be limited to the period and duration of activities associated with the Project. Decommissioning emissions are thus excluded from the quantitative HRA, as they would occur outside of the health risk exposure period, would occur at a much later date, and would be with anticipated much cleaner construction equipment.

The Project would be consistent with the applicable YSAQMD requirements and control strategies intended to reduce emissions from construction equipment and activities. The Project would comply with the CARB Air Toxics Control Measure that limits diesel powered equipment and vehicle idling to no more than 5 minutes at a location, and the CARB In-Use Off-Road Diesel Vehicle Regulation; compliance with these would minimize emissions of TACs during construction. However, sensitive receptors are located directly west and south of the defined Project Site across the bordering roadways and therefore have the potential to be exposed to TAC emissions from construction.

The estimated construction health risk is quantified in Table 5.7-10. As shown in the table, potential health risk would be below YSAQMD significance thresholds. Therefore, Project construction would not expose sensitive receptors to substantial TAC concentrations, and impacts would be less than significant.

Table 5.7-10 Construction Health Risk Assessment

Scenario	Excess Cancer Risk (per million)	Chronic Health Risk[1]
Residences Risk	1.75	0.0015
YSAQMD Significance Threshold	>10	>1
Threshold Exceeded?	No	No

[1] Noncancer health impacts are determined by dividing the airborne concentration at the receptor by the appropriate Reference Exposure Level (REL) for that substance. A REL is defined as the concentration at which no adverse noncancer health effects are anticipated. Because noncancer health impacts are assessed as the ratio of airborne concentration versus the REL, the resulting hazard index is unitless.

[2] There is no acute reference exposure level for diesel exhaust to calculate acute health risk. Furthermore, except for unusual circumstances of high exposure, Office of Environmental Health Hazard Assessment does not recommend acute analysis for DPM.

Source: Rincon Consultants 2025. Appendix D of Appendix R.

Operation

Sources of operational TAC's typically include, but are not limited to, land uses such as freeways and high-volume roadways, truck distribution centers, ports, rail yards, refineries, chrome plating facilities, dry cleaners using perchloroethylene, and gasoline dispensing facilities. The Project is not one of these uses, although use of consumer products, such as aerosol cleaning products, may result in minimal emissions of TACs. The Project is not intended to include the operation of permitted emergency back-up generators, however if one was used it would be regulated under YSAQMD permitting regulations which require emissions to be at levels that would not expose sensitive receptors to substantial health risk. As such, operations of the Project would not be a substantial source of TACs. Therefore, the impacts would be less than significant.

Overall Project

Carbon Monoxide Hotspots

A CO hotspot is a localized concentration of CO that is above a CO ambient air quality standard. Localized CO hotspots can occur at intersections with heavy peak hour traffic. Specifically, hotspots can be created at intersections where traffic levels are sufficiently high such that the local CO concentration exceeds the federal one-hour standard of 35.0 parts per million (ppm) or the federal and state eight-hour standard of 9.0 ppm (CARB 2016).

The entire SVAB is in conformance with the CAAQS and NAAQS for carbon monoxide, and most air quality monitoring stations no longer report carbon monoxide levels. The highest source of carbon monoxide exposure occurs during construction. As shown in Table 5.7-6, maximum daily carbon monoxide emissions during Project construction would be approximately 1.29 tons per year for the Vaca Dixon 57 MWh BESS component. These emissions would not exceed CAAQS or NAAQS standards, as demonstrated in Table 5.7-7. As shown in Table 5.7-8, maximum daily carbon monoxide emissions during Project operations would be less than one ton per year. These emissions would not exceed CAAQS or NAAQS standards. Based on the low background level of carbon monoxide in the Project Site, ever-improving vehicle emissions standards for new cars in accordance with state and federal regulations, and the Project's negligible level of operational carbon monoxide emissions, the Project would not create new hotspots or contribute substantially to existing hotspots. Therefore, the Project would not expose sensitive receptors to substantial carbon monoxide concentrations.

Toxic Air Contaminants

Health impacts associated with TACs are generally associated with long-term exposure. Due to the minimal emissions expected on-site from routine maintenance and off-site from employees commuting to the defined Project Site each day, there are no meaningful sources of TACs for the operating phase of the Project and therefore no reason to expect health impacts related to TACs. As such, the greatest potential for TAC emissions would be during construction and decommissioning, which may result in a short-term increase of TAC emissions.

Impact AQ-4

Threshold:	Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Overall Project

Less than Significant Impact. Substantial objectionable odors are normally associated with agriculture, wastewater treatment, industrial uses, or landfills. The Project would involve the construction, operation and maintenance, and decommissioning of a BESS facility and associated infrastructure that do not produce objectionable odors. During construction activities, only short-term, temporary odors from vehicle exhaust and construction equipment engines would occur. Construction-related odors would disperse and dissipate and would not cause substantial odors at the closest sensitive receptors (adjacent residences). In addition, construction-related odors would be short-term and would cease upon completion of construction. Operation of the Project would also emit odors from vehicle exhaust. The operational odors would be much less in magnitude due

to a limited amount of operational vehicle trips and would disperse and dissipate and would not cause substantial odors at the closest sensitive receptors. Impacts would be less than significant.

5.7.4 Cumulative Impacts

The geographic scope for the cumulative air quality impact analysis is the SVAB. Because the SVAB is designated nonattainment for the NAAQS and CAAQS for ozone and the CAAQS for PM_{10} and NAAQS for $PM_{2.5}$, there is an existing adverse cumulative effect in the SVAB relative to these pollutants.

A project would have a significant cumulative impact if it is inconsistent with the applicable adopted federal and state air quality plans. As discussed under Impact AQ-2, the Project would be consistent with the YSAQMD screening thresholds. Additionally, as discussed above under Impact AQ-1, the Project would not conflict with or obstruct implementation of the 2015 NAAQS 8-hour O_3 Attainment Plan and SFNA Exceptional Events Mitigation Plan. Therefore, the Project's contribution to cumulative air quality impacts related to criteria air pollutant emissions would be less than significant.

As discussed under Impact AQ-3, operation-related traffic is not anticipated to create a CO hotspot. Construction and decommissioning would be short-term and not result in a health risk impact, and there are negligible operational vehicle trips. Therefore, the Project's contribution to cumulative impacts to sensitive receptors related to CO hotspots would be less than significant.

Cumulative projects would adversely affect sensitive receptors from odor emissions if cumulative projects were typical odor-producing land uses. Construction of cumulative projects would result in construction equipment-related odors; however, the temporary nature of construction would ensure less than significant cumulative odor impacts. Cumulative projects are not defined as odor-producing land uses and therefore would not combine to result in substantial cumulative odors during operation. Therefore, cumulative impacts related to odors would be less than significant.

5.7.5 Laws, Ordinances, Regulations, and Standards

The relevant federal, State, and local LORS that affect air quality and apply to the Project are presented in this section. As discussed above, the Project Site is within both the City of Vacaville and unincorporated Solano County. The LORS that may apply to the Project related to air quality are summarized in Table 5.7-11. For further laws, ordinances, regulations and standards that pertain to public health, please refer to section 5.8, *Public Health*, for further information.

Table 5.7-11 LORS Applicable to Air Quality

Jurisdiction	LORS	Applicability	Opt-In Application Reference	Project Conformity
Federal	Federal Clean Air Act	Establishes federal ambient air quality standards.	Section 5.7.1.1	The Project would ensure the Project's air pollutant emissions would not contribute to federal nonattainment status of criteria pollutants in the SVAB.
State	California Clean Air Act	Establishes state ambient air quality standards.	Section 5.7.1.1	The Project would ensure the Project's air pollutant emissions would not contribute to state nonattainment status of criteria pollutants in the SVAB.
State	California Environmental Quality Act (CEQA)	Requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of the Project and to reduce environmental impacts to the extent feasible.	Throughout this Opt-In Application	The Project would comply with CEQA, as required by the California Energy Commission's Opt-In Application process.
Local	Yolo Solano Air Quality Management District Rules and Air Quality Management Plans	Regulates air pollutant emission throughout the Sacramento Valley Air Basin	Impact AQ-1 Impact AQ-2	The Project would comply with YSAQMD rules and regulations.
Local	Solano County General Plan: Policy HS.I-60	Require implementation of BMPs to reduce emissions from construction projects	Impact AQ-2	The Project will implement required BMPs and may implement other recommended BMPs to reduce construction emissions.
Local	Vacaville General Plan: Policy COS-P12.5	Require that development projects implement best management practices and Best Available Control Technologies to reduce air pollutant emissions associated with the construction and operation of the project.	Impact AQ-2	The Project would implement required BMPs and may implement other recommended BMPs to reduce construction emissions.

5.7.5.1 Federal LORS

Federal Clean Air Act

The federal CAA establishes ambient air quality standards and establishes regulatory authorities designed to attain those standards. As required by the CAA, the USEPA has identified criteria pollutants and has established NAAQS to protect public health and welfare. NAAQS have been established for ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and Pb. As required by the federal CAA, air basins or portions thereof have been classified as either "attainment" or "nonattainment" for each criteria

air pollutant, based on whether the standards have been achieved. In some cases, an area's status is unable to be determined, in which case the area is designated "unclassified". The air quality in an attainment area meets or is better than the NAAQS. A nonattainment area has air quality that is worse than the NAAQS. States are required to adopt enforceable plans, known as a SIP, to achieve and maintain air quality meeting the NAAQS.

5.7.5.2 State LORS

California Clean Air Act

The CCAA establishes state ambient air quality standards and establishes regulatory authorities designed to attain those standards. Under the CCAA, California has adopted the CAAQS, which are more stringent than the NAAQS for certain pollutants and averaging periods. Air basins or portions thereof have been classified as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether the standards have been achieved. In some cases, an area's status is unable to be determined, in which case the area is designated "unclassified". The air quality in an attainment area meets or is better than the CAAQS. A non-attainment area has air quality that is worse than the CAAQS.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of the Project and to reduce environmental impacts to the extent feasible. Appendix G of the CEQA Guidelines includes criteria for evaluating potential impacts related to air quality.

5.7.5.3 Local LORS

Yolo Solano Air Quality Management District

The Project Site is located within the jurisdiction of the YSAQMD, which regulates air pollutant emissions throughout the SVAB. The YSAQMD enforces regulations and administers permits governing stationary sources. Pursuant to Assembly Bill 205 subsection 25545.1(b)(1), the CEC retains exclusive authority over permitting and supersedes any applicable statute, ordinance, or regulation of a local air quality management district. In the absence of CEC jurisdiction, the following YSAQMD regional rules and regulations are related to the Project:

- **Rule 2-5, Nuisance:** To restrict discharge from any source quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such persons or the public or which cause to have a natural tendency to cause injury or damage to business or property.
- **Rule 2-8, Open Burning:** To limit emissions to the atmosphere from open burning.
- **Rule 2-11, Particulate Matter:** To limit release or discharge into the atmosphere, from any source, particulate matter in excess of 0.3 grains per cubic foot of exhaust volume as calculated standard conditions.
- **Rule 2-14, Architectural Coatings:** To limit the quantity of VOC in architectural coatings supplied, sold, offered for sale, applied, solicited for application, or manufactured for use within the YSAQMD.

- **Rule 3-1, General Permit Requirements:** To provide an orderly procedure for the review of new sources of air pollution and of the modification and operation of existing sources through the issuance of permits.
- **Rule 9-9, Asbestos:** To limit the emission of asbestos into the atmosphere and require an appropriate work practice standards and waste disposal procedures.

Air Quality Management Plans

As required by the federal CAA and the CCAA, air basins or portions thereof have been classified as either "attainment" or "nonattainment" for each criteria air pollutant, based on if the standards have been achieved. Jurisdictions of nonattainment areas also are required to prepare an air quality management plan that includes strategies for achieving attainment. The YSAQMD has approved management plans demonstrating how the SVAB will reach attainment with the federal one-hour and eight-hour ozone standards.

2023 SACRAMENTO REGIONAL 2015 NAAQS 8-HOUR OZONE ATTAINMENT & REASONABLE & FURTHER PROGRESS PLAN

In August 2023, the YSAQMD adopted the 2015 NAAQS 8-hr Ozone Attainment & Reasonable Further Progress Plan for Attaining the National Ambient Air Quality Standards for Ozone in the Sacramento Region (2015 O_3 Attainment Plan) (YSAQMD 2023). This 2015 8-hour Ozone NAAQS Plan was developed for the Sacramento region by the five air districts in the nonattainment area in collaboration with the CARB, the SACOG, and the Bay Area MTC. The five local air districts include: El Dorado County Air Quality Management District, Feather River Air Quality Management District, Placer County Air Pollution Control District, Sacramento Metropolitan Air Quality Management District, and YSAQMD. SACOG and MTC are the metropolitan planning organizations for transportation planning in the SFNA. At this time, the 2015 O_3 Attainment Plan has been submitted to CARB for review, and if approved, will be submitted to the U.S. EPA as a revision to the California State Implementation Plan SIP for attaining the NAAQS for ozone. The 2015 O_3 Attainment Plan includes regionwide inventories of ozone precursors, a Reasonable Further Progress demonstration that shows emissions reductions during the years leading to attainment, an assessment of Reasonably Available Control Technology and Reasonable Available Control Measures, a vehicle mile traveled (VMT) offset demonstration, and contingency measures for use in the event that emissions controls do not achieve the needed reductions. The 2015 O_3 Attainment Plan determines (1) the Sacramento Region can expect to reach attainment of the current NAAQS for ozone by 2033 with implementation of the proposed control measures and (2) the adoption of transportation control strategies and transportation control measures (TCMs) in the Sacramento Region offset the projected growth in VMT and vehicle trips (YSAQMD 2023, YSAQMD 2024b).

SACRAMENTO FEDERAL NONATTAINMENT AREA EXCEPTIONAL EVENTS MITIGATION PLAN

The SFNA has been identified by the EPA as an area that is required to develop a mitigation plan to minimize the public exposure from $PM_{2.5}$ emissions generated during wildfire events. Air districts in the SFNA-$PM_{2.5}$ (the Federal $PM_{2.5}$ Nonattainment Area) have jointly prepared the draft Wildfire Mitigation Plan (Plan) as required by Title 40, Code of Federal Regulations, Part 51.930 (40 CFR 51.930). This Plan outlines the actions each air district will take to notify the public and minimize the air quality impacts when emissions from wildfires increase $PM_{2.5}$ concentrations in the region to a level where they exceed or are expected to exceed the 24-hour $PM_{2.5}$ national ambient air quality standard. While achieving the 24-hour national standard for fine particulates is the primary focus for

the Sacramento Region, the EPA has also adopted an annual standard for fine particulates. This standard was tightened in 2012, but the YSAQMD and the rest of the Sacramento Region are consistently below it. (YSAQMD 2024b).

VACAVILLE GENERAL PLAN, CONSERVATION AND OPEN SPACE

Although not required as a separate general plan element, state guidelines also recommend that air quality be addressed in a local general plan, either as a separate, optional, element or through policies in a mandatory element. It is captured in the Conservation and Open Space Element of the General Plan. A major strategy in the Conservation and Open Space Element is to improve air quality by encouraging project designs that protect and improve air quality and minimize direct and indirect air pollutant emissions by including components that reduce vehicle trips and promote energy efficiency. Additionally, Policy COS-P12.5 of the Conservation and Open Space Element requires that development projects implement best management practices and Best Available Control Technologies to reduce air pollutant emissions associated with the construction and operation of the project.

Implementation of Best Management Practices is encouraged. Construction activities, though typically short-term in nature, can generate large quantities of fugitive dust (PM) emissions. These emissions can cause nuisance if visible quantities of dust intrude onto neighboring property, can cause health problems, as discussed above, if sensitive persons are exposed, and can damage neighboring crops. Standard best management practices, such as regular watering or application of nontoxic soil stabilizers, episodic control to limit activity on days with high winds or forecast poor air quality, installation of windbreaks, and re-establishment of ground cover on inactive areas can be very effective methods for controlling PM dust.

To minimize short-term mobile-source emissions from construction or agricultural equipment, operators of older model equipment and pumps should be encouraged to seek engine upgrades through the appropriate air quality management district or ARB incentive program.

2008 SOLANO COUNTY GENERAL PLAN, HEALTH AND SAFETY CHAPTER

Although not required as a separate general plan element, state guidelines also recommend that air quality be addressed in a local general plan, either as a separate, optional, element or through policies in a mandatory element. It is captured in the Health and Safety Chapter of the General Plan. A major strategy in the Public Health and Safety chapter is to improve air quality on a regional scale through partnerships with other Bay Area organizations.

Implementation of Best Management Practices is encouraged. Construction activities, though typically short-term in nature, can generate large quantities of fugitive PM emissions. These emissions can cause nuisance if visible quantities of dust intrude onto neighboring property, can cause health problems, as discussed above, if sensitive persons are exposed, and can damage neighboring crops. Standard best management practices, such as regular watering or application of nontoxic soil stabilizers, episodic control to limit activity on days with high winds or forecast poor air quality, installation of windbreaks, and re-establishment of ground cover on inactive areas can be very effective methods for controlling PM dust.

To minimize short-term mobile-source emissions from construction or agricultural equipment, operators of older model equipment and pumps should be encouraged to seek engine upgrades through the appropriate air quality management district or ARB incentive program. Engine idling should be minimized when equipment is not in use (Solano County 2015).

5.7.6 Agencies and Agency Contact

Table 5.7-12 provides contact information for agencies involved with air quality.

Table 5.7-12 Agency Contacts for Air Quality

Issue	Agency	Contact
Public exposure to air pollutants	California Air Resources Board	LinYing Li 1001 I Street, 19th Floor Sacramento, California 95814 916-322-1721
Public exposure to air pollutants	Yolo Solano Air Quality Management District	Briella Schaeffer Jamros Public Information Officer 1947 Galileo Court, Suite 103 Davis, California 95618 530-757 3650

5.7.7 Permits and Permit Schedule

Pursuant to Assembly Bill 205 subsection 25545.1(b)(1), the CEC retains exclusive authority over permitting and supersedes any applicable statute, ordinance, or regulation of a local air quality management district. The Applicant and CEC would collaborate with the YSAQMD on review of this Opt-In Application to ensure compliance with YSAQMD rules and regulations.

5.7.8 References

California Air Resources Board (CARB). 2016. California Ambient Air Quality Standards. https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards (accessed October 2025).

_____. 2020. 2020 SF6 Initial Statement Of Reasons: Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear. July 2020. https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2020/sf6/isor.pdf (accessed December 2024).

_____. 2023. “Overview Diesel Exhaust & Health” [webpage]. N.d. https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health (accessed December 2024).

_____. 2024. iADAM Air Quality Data Statistics. Top 4 Summary. https://www.arb.ca.gov/adam (accessed December 2024).

_____. 2025. “Electricity Transmission and Distribution Greenhouse Gas Emissions”. N.d. [website]. https://ww2.arb.ca.gov/our-work/programs/elec-tandd (accessed October 2025).

Rincon Consultants, Inc. 2025. Vaca Dixon Power Center Project Air Quality and Greenhouse Gas Emissions Study. November 2025.

Solano, County of. 2015. Solano County General Plan; Chapter 5 – Public health & Safety. August 11. https://www.solanocounty.com/depts/rm/planning/general_plan.asp (accessed January 2024.

United States Environmental Protection Agency (USEPA). 2024a. Health Effect of Ozone Pollution. Last Modified: May 24,2023 https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution (accessed December 2024)

_____. 2024b. Basic Information about NO_2. Last Modified: July 25, 2023 https://www.epa.gov/no2-pollution/basic-information-about-no2#Effects (accessed December 2024)

_____. 2024c. Basic Information about Carbon Monoxide (CO) Outdoor Air Pollution. Last Modified: July 13,2023 https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution#Effects (accessed December 2024)

_____. 2024d. Sulfur Dioxide Basics. Last Modified: February 16, 2023 https://www.epa.gov/so2-pollution/sulfur-dioxide-basics (accessed December 2024).

_____. 2024e. Basic Information about Lead Air Pollution. Last Modified: July 5, 2023 https://www.epa.gov/lead-air-pollution/basic-information-about-lead-air-pollution#health%20effects (accessed December 2024).

_____. 2024f. Health and Environmental Effects of Hazardous Air Pollutants. Last Modified: March 27, 2023. https://www.epa.gov/haps/health-and-environmental-effects-hazardous-air-pollutants (accessed December 2024)

_____. 2024g. National Ambient Air Quality Standards (NAAQS) for PM. https://www.epa.gov/pm-pollution/national-ambient-air-quality-standards-naaqs-pm. (access December 2024)

Yolo-Solano Air Quality Management District (YSAQMD). 2007. Handbook for Assessing and Mitigating Air Quality Impacts. https://www.ysaqmd.org/wp-content/uploads/Planning/CEQAHandbook2007.pdf (accessed December 2024).

_____. 2023. 2015 NAAQS 8-hr Ozone Attainment & Reasonable Further Progress Plan. https://www.ysaqmd.org/plans-data/ozone/ (accessed December 2024)

_____. 2024a. Planning for Ozone Standards. https://www.ysaqmd.org/plans-data/ozone/ (accessed December 2024).

_____. 2024b. Planning for Particulate Standards. https://ysaqmd.org/plans-data/particulates/ (accessed December 2024).