
AIR QUALITY

SUMMARY

The OARB Redevelopment EIR evaluated the potential impacts on air quality resulting from implementation of the OARB Redevelopment/Reuse Plan. In general, redevelopment would involve activities that produce pollutant emissions. These OARB are-wide activities include construction and remediation, vessel movement, cargo handling and transport, passenger car travel, and operation and maintenance of commercial development. Both criteria and toxic pollutants would be emitted in the Redevelopment Area. Toxic Air Contaminants (TACs) would be emitted in the form of particulate matter from diesel fuel exhaust. Construction/remediation emissions consist of fugitive dust from earth disturbing activities and equipment exhaust from combustion of gasoline and diesel fuel. Cargo ships, tugboats, on-dock equipment, and trains in the Redevelopment Area would emit pollutants in the exhaust, as would trucks and vehicles traveling through the Area. Other land uses would also be sources of emissions from combustion of natural gas for space and water heating, exhaust emissions from landscaping equipment, and volatile organic compound emissions from miscellaneous consumer products, solvents, and cleaners as would emissions from trucks and vehicles from within the Redevelopment Area.

The proposed Project would incur a greater degree of air quality impacts in the Redevelopment Area than previously identified for the site, since the uses proposed under the Project generate more traffic than those evaluated for the Project site under the OARB Redevelopment EIR. An Auto Mall, “big box” retail, and ancillary retail uses would lead to a net increase in vehicle emissions over emissions levels estimated in the OARB Redevelopment EIR. Construction and remediation air quality impacts identified in the OARB Redevelopment EIR would also occur but at no significantly different level than identified in the OARB Redevelopment EIR.

Vehicle (mobile) emissions were reevaluated for the Project and Option B including the cumulative impact with updated cumulative circumstances.

EXISTING CONDITIONS

METEOROLOGY AND CLIMATOLOGY

Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

The climate of the San Francisco Bay Area is classified as Mediterranean, and has mild, wet winters and warm, dry summers. The regional climate is controlled primarily by the Pacific high-pressure system over the eastern Pacific Ocean and by local topography. Local climate is strongly influenced by topography and proximity to the Pacific Ocean and San Francisco Bay. Cool, onshore winds blowing from the Pacific have a moderating effect, especially west of the Diablo Mountain Range where the study area is located. These mountains act as a barrier to onshore winds, resulting in the channeling of airflow along canyons, valleys, and through straits in the Bay, as well as strong west-to-east temperature differences. The resulting overall air flow patterns are complex, exhibiting much local variation. Large-scale winds, which are the wind patterns influenced by general geographical and topographical features of the San Francisco Bay Area on a roughly 50-mile scale, are predominantly from the west from the Golden Gate toward the Delta.

Atmospheric dispersion of pollutants is influenced by several parameters, including temperature inversion. An inversion is a layer of cooler air near the ground surface trapped below a layer of warm air aloft. This condition restricts vertical movement or mixing of pollutants, and therefore allows pollutant concentrations to increase. Inversions can be caused by several different combinations of meteorological conditions, and can occur in both the summer and winter in the study area.

In the immediate study area, the flow of marine air traveling through the Golden Gate, across San Francisco and through the San Bruno Gap is the dominant weather factor. Prevailing winds are from the west (CARB 1984). Air pollution potential in Northern Alameda County is lowest close to the Bay where the study area is located, due largely to two factors: good ventilation from winds that are frequently brisk, and a relatively low flux of pollutants from upwind areas. The occurrence of light winds in the early morning and late evening occasionally causes elevated levels of pollutants (BAAQMD 1996). Particularly during the summer and fall, emissions generated within, and those transported to, the East Bay can combine with abundant sunshine under the restraining influences of topography and temperature inversions to create conditions that are conducive to the formation of photochemical pollutants, like ozone.

REGULATORY SETTING

The study area for air quality is the San Francisco Bay Area Air Basin. The air basin encompasses all or part of nine counties surrounding San Francisco Bay: all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties; and portions of Solano and Sonoma counties.

Criteria Air Pollutants

Ambient air quality standards have been established by state and federal environmental agencies for specific air pollutants most pervasive in urban environments. These pollutants are referred to as criteria air pollutants because the standards established for them were developed to meet specific health and welfare criteria set forth in the enabling legislation. The criteria air pollutants emitted by the proposed project include ozone (O₃) precursors, carbon monoxide (CO), nitrogen dioxide (NO₂), and suspended particulate matter (PM₁₀ and PM_{2.5}). Other criteria pollutants, such as lead (Pb) and sulfur dioxide (SO₂), would not be substantially emitted by the

proposed Project or project traffic, and air quality standards for them are being met throughout the Bay Area.

Ozone

While O₃ serves a beneficial purpose in the upper atmosphere (stratosphere) by reducing ultraviolet radiation potentially harmful to humans, when it reaches elevated concentrations in the lower atmosphere it can be harmful to the human respiratory system and to sensitive species of plants. O₃ concentrations build to peak levels during periods of light winds, bright sunshine, and high temperatures. Short-term O₃ exposure can reduce lung function in children, make persons susceptible to respiratory infection, and produce symptoms that cause people to seek medical treatment for respiratory distress. Long-term exposure can impair lung defense mechanisms and lead to emphysema and chronic bronchitis. Sensitivity to O₃ varies among individuals, but about 20 percent of the population is sensitive to O₃, with exercising children being particularly vulnerable. O₃ is formed in the atmosphere by a complex series of photochemical reactions that involve “ozone precursors” that are two large families of pollutants: oxides of nitrogen (NO_x) and reactive organic gases (ROG). NO_x and ROG are emitted from a variety of stationary and mobile sources. While NO₂, an oxide of nitrogen, is another criteria pollutant itself, ROGs are not in that category, but are included in this discussion as O₃ precursors.

Carbon Monoxide

Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause dizziness and fatigue, impair central nervous system function, and induce angina in persons with serious heart disease. Primary sources of CO in ambient air are passenger cars, light-duty trucks, and residential wood burning.

Nitrogen Dioxide

The major health effect from exposure to high levels of NO₂ is the risk of acute and chronic respiratory disease. NO₂ is a combustion by-product, but it can also form in the atmosphere by chemical reaction. NO₂ is a reddish-brown colored gas often observed during the same conditions that produce high levels of O₃ and can affect regional visibility. NO₂ is one compound in a group of compounds consisting of oxides of nitrogen (NO_x). As described above, NO_x is an O₃ precursor compound.

Particulate Matter

Particulate matter consists of particles of various sizes which can be inhaled into the lungs and cause adverse health effects. Particulate matter is regulated by the fraction of coarse particulates 10 microns (a micron is one one-millionth of a meter) or less in diameter (PM₁₀) and by the fraction of fine particulates 2.5 microns or less in diameter (PM_{2.5}). The health effects from long-term exposure to high concentrations of particulate matter are increased risk of chronic respiratory disease like asthma, and altered lung function in children. Short-term exposure to high levels of particulate matter has been shown to increase the number of people seeking medical treatment for respiratory distress, and to increase mortality among those with severe respiratory problems. Particulate matter also results in reduced visibility. Ambient particulate matter has many sources. It is emitted directly by combustion sources like motor vehicles, industrial facilities, and residential wood burning, and in the form of dust from ground-

disturbing activities such as construction and farming. It also forms in the atmosphere from the chemical reaction of precursor gases.

Federal Regulations

The study area is subject to major air quality planning programs required by the federal Clean Air Act (CAA) (1977, last amended in 1990, 42 United States Code [USC] 7401 *et seq.*). The CAA required that regional planning and air pollution control agencies prepare a regional Air Quality Plan to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards within the deadlines specified in the Clean Air Act. For the Bay Area Air Basin, the Association of Bay Area Governments (ABAG), the Metropolitan Transportation Commission (MTC), and the Bay Area Air Quality Management District (BAAQMD) jointly prepared a *Bay Area Air Quality Plan* in 1982. The plan, which is referred to as the State Implementation Plan (SIP), must contain control strategies that demonstrate attainment with national ambient air quality standards by deadlines established in the federal CAA.

The Bay Area Air Basin attainment status with respect to federal standards is summarized in Table 4-1. In general, the Bay Area experiences low concentrations of most pollutants when compared to federal standards, except for ozone, for which standards are exceeded periodically. In 2005, the U.S. Environmental Protection Agency (EPA) revoked the 1-hour ozone standard, though the Bay Area Air Basin has a “non-attainment” designation for the federal 8-hour standard as well. In 1998, after many years without violations of any carbon monoxide (CO) standards, the attainment status for CO was upgraded to “attainment.”

State and Regional Regulations

In 1988, California passed the California Clean Air Act (CCAA, California Health and Safety Code § 39600 *et seq.*) which, like its federal counterpart, called for designations of areas as attainment or non-attainment, based on state Ambient Air Quality Standards rather than federal or national standards. The California Air Resources Board (CARB or ARB) is the state agency responsible for regulating air quality. CARB responsibilities include establishing State Ambient Air Quality Standards. The Bay Area Air Basin attainment status with respect to state standards is summarized in Table 4-1. In general, this table indicates the Bay Area experiences low concentrations of most pollutants when compared to state standards, except for ozone and particulate matter, for which standards are exceeded periodically.

Under the CCAA, the Bay Area Air Basin is required to have a Clean Air Plan (CAP) to achieve and maintain ozone standards. The most recent draft revision to the CAP was completed in 2000. The 2000 CAP applies control measures to stationary sources, mobile sources, and transportation control measures (TCMs). Although the 2000 CAP is an ozone plan, it includes PM₁₀ attainment planning as an informational item. In January 2006, BAAQMD adopted the Bay Area 2005 Ozone Strategy to update and build upon the 2000 CAP.

Both the federal SIP and the state CAP rely on the combined emission control programs of the EPA, California Air Resources Board (CARB), and the Bay Area Air Quality Management District (BAAQMD). The BAAQMD is the regional agency responsible for air quality regulation within the San Francisco Bay Area Air Basin. The BAAQMD regulates air quality through its planning and review activities.

Under California law, the responsibility to carry out air pollution control programs is split between the CARB and local or regional air pollution control agencies. In the study area, the BAAQMD regulates stationary sources, and can require stationary sources to obtain permits, and can impose emission limits, set fuel or material specifications, or establish operational limits to reduce air emissions.

The CARB shares the regulation of mobile sources with the EPA, and has authority to set emission standards for on-road motor vehicles and for some classes of off-road mobile sources that are sold in California. The emission standards most relevant to redevelopment as proposed are those related to automobiles, light- and medium-duty trucks, and California heavy-duty truck engines. The CARB also regulates vehicle fuels, with the intent to reduce emissions, and has set emission reduction performance requirements for gasoline (California reformulated gasoline), and limited the sulfur and aromatic content of diesel fuel to make it burn cleaner. The CARB also sets the standards used to pass or fail vehicles in smog check and heavy-duty truck inspection programs. Mobile source and transportation control measures (TCMs) are implemented largely through incentive programs and transportation programs in cooperation with the MTC, local governments, transit agencies, and others.

National and State Ambient Air Quality Standards

The CAA and CCAA promulgate, respectively, national and state ambient air quality standards for carbon monoxide (CO), ozone (O₃), nitrogen dioxide (NO₂), particulate matter 10 microns or less in diameter (PM₁₀), and particulate matter 2.5 microns or less in diameter (PM_{2.5}).¹ Ambient standards specify the concentration of pollutants to which the public may be exposed without adverse health effects. Individuals vary widely in their sensitivity to air pollutants, and standards are set to protect more pollution-sensitive populations (*e.g.*, children and the elderly). National and state standards are reviewed and updated periodically based on new health studies. California ambient standards tend to be at least as protective as national ambient standards and are often more stringent. National and state ambient air quality standards are presented in **Table 4-1**.

For planning purposes, regions like the San Francisco Bay Area are given an air quality status designation by the federal and state regulatory agencies. Areas with monitored pollutant concentrations that are lower than ambient air quality standards are designated “attainment” on a pollutant-by-pollutant basis. When monitored concentrations exceed ambient standards within an air basin, it is designated “nonattainment” for that pollutant. An area that recently exceeded ambient standards, but is now in attainment, is designated “maintenance.”

¹ Other pollutants (*e.g.*, lead, sulfur dioxide) also have ambient standards, but they are not discussed in this document because emissions of these pollutants from the project are expected to be negligible.

**Table 4-1
State and Federal Ambient Air Quality Standards and Attainment Standard**

Pollutant	Averaging Time	California Standards ¹		National Standards ²	
		Concentration	Attainment Status	Concentration ³	Attainment Status
Ozone	8 Hour	0.07 ppm (137 µg/m ³)	See Footnote 8	0.08 ppm	N ⁴
	1 Hour	0.09 ppm (180 µg/m ³)	N		
Carbon Monoxide	8 Hour	9.0 ppm (10 mg/m ³)	A	9 ppm (10 mg/m ³)	A ⁶
	1 Hour	20 ppm (23 mg/m ³)	A	35 ppm (40 mg/m ³)	A
Nitrogen Dioxide	Annual Average			0.053 ppm (100 µg/m ³)	A
	1 Hour	0.25 ppm (470 µg/m ³)	A		
Particulate Matter (PM10)	Annual Arithmetic Mean	20 µg/m ³	N ⁷	50 µg/m ³	A
	24 Hour	50 µg/m ³	N	150 µg/m ³	U
Particulate Matter – Fine (PM2.5)	Annual Arithmetic Mean	12 µg/m ³	N ⁷	15 µg/m ³	A
	24 Hour			65 µg/m ³	A

A=Attainment N=Nonattainment U=Unclassified
 mg/m³=milligrams per cubic meter ppm=parts per million µg/m³=micrograms per cubic meter

1. California standards for ozone, carbon monoxide, sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM10, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, carbon monoxide, and hydrogen sulfide are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for the PM10 annual standard), then some measurements may be excluded. In particular, measurements are excluded that ARB determines would occur less than once per year on the average.

2. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.08 ppm or less. The 24-hour PM10 standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m³. The 24-hour PM2.5 standard is attained when the 3-year average of 98th percentiles is less than 65 µg/m³.

Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM10 is met if the 3-year average falls below the standard at every site. The annual PM2.5 standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.

3. National air quality standards are set at levels determined to be protective of public health with an adequate margin of safety. Each state must attain these standards no later than three years after that state's implementation plan is approved by the Environmental Protection Agency.

4. In June 2004, the Bay Area was designated as a marginal nonattainment area of the national 8-hour ozone standard.

5. The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.

6. In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.

7. In June 2002, CARB established new annual standards for PM2.5 and PM10.

8. This standard was approved by the Air Resources Board on April 28, 2005 and is expected to become effective in early 2006.

SOURCE: Bay Area Air Quality Management District Internet web site. Standards and attainment status as of January 2006. <http://www.baaqmd.gov/planning/resmod/baas.htm>

The Bay Area is currently a non-attainment area for national and state ambient air quality standards for ground level ozone and state standards for particulate matter. In April 2004 (taking effect June 2004), EPA formally designated the Bay Area as a nonattainment area for the national 8-hour ozone standard, and classified the region as “marginal” according to five classes of nonattainment area for ozone which range from marginal to extreme. For state air quality planning purposes, the Bay Area is classified as a serious nonattainment area for ozone. The serious classification triggers various plan submittal requirements and transportation performance standards, including tri-annual updating of the Clean Air Plan.

Amended Particulate Matter Standards

Based on an evaluation of the latest scientific knowledge, the EPA is currently proposing to amend national health standards based particulate matter. The proposed rule was published in the National Register on January 17, 2006 and the EPA must finalize proposed standards by September 27, 2006. The proposal includes strengthening the 24-hour fine particle ($PM_{2.5}$) standard by lowering it from the current level of 65 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) to 35 $\mu\text{g}/\text{m}^3$ and retaining the level of the annual fine particle standard at 15 $\mu\text{g}/\text{m}^3$. In addition, the proposed revisions would change the definition of the coarse particulate matter (PM_{10}) standard so that it covers only particles between 10 and 2.5 micrometers in diameter ($PM_{10-2.5}$), also known as “inhalable coarse particles” in response to a 1999 U.S. Court of Appeals for the D.C. Circuit decision directing EPA to ensure that regulations for coarse particles did not duplicate regulation of fine particles. The current PM_{10} standards, applying to particles 10 micrometers in diameter and smaller, are a 24-hour standard of 150 $\mu\text{g}/\text{m}^3$, and an annual standard of 50 $\mu\text{g}/\text{m}^3$ and are proposed to be revoked (either immediately or at such time that $PM_{10-2.5}$ monitoring can be implemented). The proposed new $PM_{10-2.5}$ standard would apply to only those particles between 2.5 and 10 microns in diameter and would be a 24-hour standard set at 70 $\mu\text{g}/\text{m}^3$. EPA is not proposing an annual standard for $PM_{10-2.5}$. Current scientific evidence does not show significant public health risks associated with long-term exposure to coarse particles.²

Under the current proposal, there are two separate implementation schedules, one for fine particulates and one for coarse inhalable particulates. For $PM_{2.5}$, it is expected final attainment/nonattainment designations would become effective in April 2010, states would have 3 years to write implementation plans due in 2013, and standards would need to be met in most cases by April 2015. For $PM_{10-2.5}$, 3 years of monitoring data would first be collected and made available and it is expected final attainment/nonattainment designations would become effective in July 2013, states would have 3 years to write implementation plans due in 2016, and standards would need to be met in most cases by July 2018.²

Criteria Pollutants

Federal, state, and regional control programs above are directed primarily toward criteria pollutants—the pollutants for which ambient air quality standards exist. Programs are also in place to reduce public exposure to other pollutants, such as those that present a potential hazard to public health. These are termed “hazardous air pollutants” (HAPs) in federal law and “toxic air contaminants” (TACs) in California law. TACs are pollutants “. . . which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or

² Source: EPA website <http://www.epa.gov/air/particlepollution/actions.html>

potential hazard to human health” (BAAQMD 1997). Federal and state programs are currently directed toward reducing TAC emissions from stationary sources. Unlike criteria pollutants, TACs do not have ambient standards; however, BAAQMD regulates new or expanding stationary sources of TACs.

Toxic Air Contaminants: TACs do not have ambient air quality standards. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer. For TACs that are known or suspected carcinogens, the CARB has consistently found there are no levels or thresholds below which exposure is risk free. Individual TACs vary greatly in the risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another. Where data are sufficient to do so, a “unit risk factor” can be developed for cancer risk. The unit risk factor expresses assumed risk to a hypothetical population in terms of the estimated number of individuals in a million who may develop cancer as the result of continuous, lifetime (70-year) exposure to 1 microgram per cubic meter ($\mu\text{g}/\text{m}^3$) (equal to one part per million) of the TAC. Unit risk factors provide a standard that can be used to establish regulatory thresholds for permitting purposes. However, they are not a measure of actual health risk because actual populations do not experience the extent and duration of exposure that the hypothetical population is assumed to experience. For non-cancer health effects, a similar factor called a Hazard Index is used.

In 1998, the CARB formally identified particulate matter emitted by diesel-fueled engines as a TAC. Diesel engines emit TACs in both gaseous and particulate forms. The particles emitted by diesel engines are coated with chemicals, many of which have been identified by the EPA as HAPs, and by the CARB as TACs. The vast majority of diesel exhaust particles are very small (94 percent of their combined mass consists of particles less than 2.5 microns in diameter), both the particles and their coating of TACs can be inhaled into the lungs. While the gaseous portion of diesel exhaust also contains TACs, the CARB’s action was specific to diesel particulate emissions which, according to supporting CARB studies, represent 50 to 90 percent of the mutagenicity of diesel exhaust (CARB 1998).

The CARB action was taken at the end of a lengthy process that considered dozens of health studies, extensive analysis of health effects and exposure data, and public input collected over the last nine years. CARB’s Scientific Advisory Committee has recommended a unit risk factor of 300 in a million for diesel particulate.³ The CARB action will lead to additional control of diesel engine emissions in coming years by CARB. The EPA has also begun an evaluation of both the cancer and non-cancer health effects of diesel exhaust.

The 1998 ruling prompted the CARB to begin searching for means to reduce diesel PM emissions. In September 2000, the CARB approved the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (Diesel Risk Reduction Plan). The Diesel Risk Reduction Plan outlines a comprehensive and ambitious program that includes the development of numerous new control measures over the next several years aimed at substantially reducing emissions from new and existing on-road vehicles (*e.g.*, heavy duty trucks and buses), off-road equipment (*e.g.*, graders, tractors, forklifts, sweepers, and boats), portable equipment (*e.g.*, pumps), and stationary engines (*e.g.*, stand-by power generators).

³ The Scientific Review Committee findings are Attachment A to CARB Resolution 98-35, August 27, 1998.

EXISTING AIR QUALITY

Emission Inventory

Table 4-2 presents the CARB Almanac Emission Projection Data for CO, ROGs, NO_x, PM₁₀, and PM_{2.5}, for the Bay Area and for Alameda County. Projections of expected future emission levels are based on expected growth rates in population, employment, industrial/commercial activity, travel, and energy use, and consider the effects of control measures already adopted by the EPA, CARB, and BAAQMD, and some proposed measures as well.

Inventory information presented in Table 4-2 indicates that Alameda County's contribution to regional emissions is generally consistent over time, between 5 to 20 percent per year, depending on pollutant. The CARB expects the percentage of Alameda County's contribution to basin-wide emissions would remain approximately the same per pollutant within the region, and expects within the region that total annual tons of CO, ROGs, and NO_x will decrease over time, and total annual tons of SO₂, PM_{2.5}, and PM₁₀ will increase.

Table 4-2
Bay Area Emission Inventory Summary and Projections (2000 to 2020)^a

Pollutant	2000		2005		2010		2020	
	Bay Area (tons/day) ^c	Alameda County's Share ^b	Bay Area (tons/day) ^c	Alameda County's Share ^b	Bay Area (tons/day) ^c	Alameda County's Share ^b	Bay Area (tons/day) ^c	Alameda County's Share ^b
CO	2,837	20%	2,249	19%	1,815	20%	1,254	19%
ROGs	619	19%	499	18%	446	18%	396	18%
NO _x	622	20%	526	19%	439	19%	312	18%
PM ₁₀	169	20%	174	19%	175	20%	180	19%
PM _{2.5}	86	20%	87	19%	85	19%	86	19%

Source: CARB, Almanac Emission Projection Data, 2005. Available at www.arb.ca.gov

Notes:

^a Projections use a 2004 base year

^b Percent of Bay Area emissions attributable to Alameda County sources.

^c Annual Average

Pollutant Monitoring

The BAAQMD operates a regional air quality monitoring network for the six criteria pollutants. Monitoring data from the BAAQMD network are used by the EPA and CARB to designate the attainment status of the region and to classify the severity of nonattainment conditions (see discussion of planning requirements, above). Table 4-1 describes the attainment status of the Bay Area region relevant to federal and state ambient air quality standards. The large number of "attainment" designations shown in Table 4-1 indicates that the Bay Area experiences low concentrations of most pollutants, the exceptions being O₃ and particulate matter, for which standards are exceeded periodically.

The BAAQMD monitoring stations nearest to the redevelopment project area are as follows:

- Alice Street, Oakland (monitors O₃ and CO)
- 7th Street, Richmond (monitors SO₂)

Existing and probable future levels of air quality can generally be inferred from ambient air quality measurements conducted by the BAAQMD at its monitoring stations. The monitoring station closest to the project site is on Alice Street near Jack London Square in Oakland, located about 2.5 miles southeast of the site and monitors ozone and carbon monoxide. The Alice Street station does not monitor PM₁₀, however, monitoring stations for PM₁₀ and PM_{2.5} were operated on and near the OARB under BAAQMD supervision and will be discussed separately. No BAAQMD monitoring station representative of the project area monitors NO_x.

Table 4-3 summarizes three years of ambient air quality data measured at these stations. Monitoring data from stations closest to the project area generally reflect the regional pattern. The state and federal ozone standards have not been violated at the Oakland monitoring station over this period. However, ozone is a regional pollutant and the Air Basin is still non-attainment because of violations at other monitoring stations in the Air Basin. State and federal ambient standards for sulfur dioxide and nitrogen dioxide are being met throughout the Air Basin, and the BAAQMD does not expect these standards to be exceeded in the future.

Table 4-3
Summary of Criteria Air Pollutant Monitoring Data

Monitoring Station	Air Quality Indicator	2001	2002	2003
Ozone (O₃)				
Alice Street (Oakland)	Peak 8-hour concentration (ppm)	0.043	0.043	0.054
	Days above federal standard	0	0	0
	Peak 1-hour concentration (ppm)	0.069	0.053	0.081
	Days above state standard	0	0	0
Carbon Monoxide (CO)				
Alice Street ^a (Oakland)	Peak 1-hour concentration (ppm)	5	4.4	3.9
	Days above federal standard	0	0	0
	Days above state standard	0	0	0
	Peak 8-hour concentration (ppm)	4	3.3	2.8
	Days above federal standard	0	0	0
	Days above state standard	0	0	0

Source: CARB 2001, 2002, and 2003, California Air Quality Data.

Notes: -- Data not available. For monitored PM₁₀ and PM_{2.5} data closest to the study area, see Table 4-4.

To increase knowledge of particulate exposure at and near the Port of Oakland, in April 1997, the Port of Oakland initiated a monitoring program to measure PM₁₀ and PM_{2.5} at two locations. One PM monitoring station is located on Port property near the intersection of 7th Street and Middle Harbor Road. The second monitoring station is located near the intersection of Filbert and 24th streets in a residential area of West Oakland. The monitoring program is being coordinated with the BAAQMD.

Data have been reported for the years 1997 through 2004 and are summarized in Table 4-4 (GAIA 2001). Data was collected from the Port monitoring station until April 2004.

**Table 4-4
PM_{2.5} and PM₁₀ Concentrations^a and Exceedances 1997 to 2004**

	Port of Oakland Site (7 th /Middle Harbor Road)				West Oakland (Filbert/24 th Street)			
	PM _{2.5}	PM ₁₀	Days Exceeding National/State Max. 24-hour Standards		PM _{2.5}	PM ₁₀	Days Exceeding National/State Max. 24-hour Standards	
			PM _{2.5}	PM ₁₀			PM _{2.5}	PM ₁₀
Annual Average Concentration								
1997 ^c	10.6	25.5	0/--	0/2	9.6	23.6	0/--	0/1
1998	10.8	26.5	0/--	0/6	9.9	22.2	0/--	0/1
1999	12.6	34.6	0/--	0/14	11.8	25.5	0/--	0/4
2000	11.0	30.6	0/--	0/2	11.2	25.0	0/--	0/2
2001 ^d	11.6	33.4	0/--	0/7	10.6	26.8	0/--	0/3
2002 ^e	10.6	27.1	0/--	0/4	11.0	25.6	0/--	0/2
2003 ^f	12.5	16.2	0/--	0/0	9.9	22.3	0/--	0/2
2004 ^g	no data	no data	--	--	9.9	19.6	0/--	0/0

Source: GAIA 2001-2005. Available at www.portofoakland.com/environm/prog_04.asp

Notes:

- ^a All concentrations in $\mu\text{g}/\text{m}^3$ (micrograms per cubic meter)
^c April 1997 – December 1997
^d January 2001 – August 2001
^e September 2001 – August 2002
^f September 2002 – August 2003
^g May 2004 – December 2004
 -- = Not applicable (no standard and/or no data)

SOURCES OF AIR POLLUTION

This Draft Supplemental EIR analyzes the impacts of the Project or Option B with new project description and changed circumstances. Since the uses proposed under the Project or Option B would have different trip generation than the uses proposed under the OARB Redevelopment EIR, mobile (vehicle) source emissions are being reevaluated.

The OARB Redevelopment EIR used an alternate baseline of 1995 to compare the projected levels of activity and air pollutant emissions associated with redevelopment to those of the Base when it was still operating in 1995. The Project (or Option B) is not expected to be a significant source of stationary source emissions or to increase those emissions over what was analyzed in the OARB Redevelopment EIR, so stationary source emissions are not re-analyzed in this Draft SEIR.

IMPACTS AND MITIGATION MEASURES

Significance Criteria

The Initial Study determined some areas of Air Quality analysis were adequately assessed in the 2002 OARB Redevelopment EIR for the Project. However, because the Project could generate more traffic than the uses studied under the 2002 OARB Redevelopment EIR which could lead to a net increase in vehicle emissions over emissions levels previously estimated, air quality impacts relating to vehicle emissions were reassessed in this Draft SEIR. As per the relevant

items in Appendix G of the BAAQMD CEQA Guidelines and City of Oakland guidelines, the Project may be deemed to have a significant adverse impact on the environment if it would:

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Contribute to CO concentrations exceeding the state ambient air quality standards of 9 ppm averaged over 8 hours and 20 ppm for 1 hour (Note: Pursuant to BAAQMD, localized carbon monoxide concentrations should be estimated for projects in which (1) vehicle emissions of CO would exceed 550 lb/day; (2) intersections or roadway links would decline to LOS E or F; (3) intersections operating at LOS E or F will have reduced LOS; or (4) traffic volume increase on nearby roadways by 10% or more unless the increase in traffic volume is less than 100 vehicles per hour);
- Result in total emissions of ROG, NO_x, or PM₁₀ of 15 tons per year or greater, or 80 pounds (36 kilograms) per day or greater;
- Result in a substantial increase in diesel emissions.

Impact Assessment Methodology

Project-related air quality impacts fall into two categories: short-term impacts due to construction, and long-term impacts due to project operation. During project construction, the project would affect local particulate concentrations primarily due to fugitive dust sources. Over the long-term, the project would result in an increase in emissions primarily due to increased motor vehicle trips.

The Project would not have significantly different construction-related impacts than the uses studied under the OARB Redevelopment EIR. Therefore, the Initial Study determined that construction-related impacts were adequately addressed in the previous EIR and no further analysis is required. Relevant construction-related mitigation measures from the OARB Redevelopment EIR would remain applicable to the project (as listed in Appendix A).

Because the Project as proposed could result in higher levels of traffic than the uses proposed for the site under the OARB Redevelopment EIR, operational vehicle emissions were reassessed. Vehicle emissions were estimated using CARB's URBEMIS 2002 model (version 7.5) and compared to BAAQMD significance thresholds. The year 2007 was used for the model as that is the current estimate of when the project uses would be operational. Carbon monoxide impacts were evaluated using a screening form of CalTrans' CALINE 4 dispersion model to predict maximum 1-and 8-hour concentrations near congestion-impacted intersections. Incremental health risks associated with diesel exhaust were evaluated for project-related truck traffic using fleet mix and truck emission factors from the URBEMIS 2002 model, diesel exhaust emission rates from CARB's EMFAC2002 model, dispersion modeling using EPA's SCREEN3 model, and CARB's health risk assessment methodology.

REGIONAL POLLUTANT EMISSIONS

Impact Air-1: Permanent Regional Impacts. Additional trips to and from the project would result in new air pollutant emissions within the air basin.

Significance: For the Project, Less than Significant

For Option B, Potentially Significant

MM Air-1: Transportation Control Measures. Major developers shall fund on a fair share basis BAAQMD-recommended feasible Transportation Control Measures (TCMs) for reducing vehicle emissions from commercial, institutional, and industrial operations, as well as all CAP TCMs the BAAQMD has identified as appropriate for local implementation.

Residual Significance: For the Project, Less than Significant

For Option B, Significant and Unavoidable

Estimated emissions resulting from year 2007 operations at the Project site for both Project conditions and the expanded Option B conditions are presented in Table 4-5 below.

Pollutant	ROG	NO_x	PM₁₀
Significance Threshold	80	80	80
Project			
New Emissions	73.3	68.0	56.2
Existing Uses Emissions	10.8	13.0	12.5
Net Change ^b	62.5	55.0	43.7
Option B			
New Emissions	123.3	115.3	95.3
Existing Uses Emissions	42.6	39.6	38.2
Net Change ^b	80.7	75.7	57.1

^a Emission factors were generated by BAAQMD's URBEMIS 2002 7.5.0 model for San Francisco Air Basin. All daily estimates are for summertime conditions except for CO, which assumes wintertime conditions.

^b Emissions for the existing uses were subtracted from those generated by the proposed uses (new emissions)

Source: Ballanti

For the Project, the emissions from these new trips would not exceed the BAAQMD thresholds of significance, and therefore would be a less than significant impact.

For Option B, the emissions of reactive organic gases (ROG) from these new trips (estimated at 80.7 pounds per day) would slightly exceed the BAAQMD thresholds of significance for ROG (80 pounds per day), and therefore represent a potentially significant impact.

Each major developer shall fund its fair share toward some or all of the transportation control measures (TCMs) shown on the following Table 4-6:

**Table 4-6
Transportation Control Measures (TCMs)
Recommended for the OARB Redevelopment Area**

Control Measure	Measure
BAAQMD-Recommended TCMs^a	
1	Construct transit facilities such as bus turnouts/bus bulbs, benches, shelters, etc. Improve transit bus service to the area.
2	Design and locate buildings to facilitate transit access, e.g., locate building entrances near transit stops, eliminate building setbacks, etc.
4	Encourage use of car pools, vanpools, and public transit by providing incentives.
5	Provide a shuttle to and from the West Oakland BART station
6	Provide on-site shops and services for employees, such as cafeteria, bank, dry cleaners, convenience market, etc.
7	Provide on-site child care, or contribute to off-site child care within walking distance.
8	Establish mid-day shuttle service from worksite to food service establishments/commercial areas.
9	Provide preferential parking for carpool and vanpool vehicles
10	Implement parking fees for single occupancy vehicle commuters.
11	Provide secure, weather-protected bicycle parking for employees.
12	Provide safe, direct access for bicyclists to adjacent bicycle routes.
13	Provide showers and lockers for employees bicycling or walking to work.
14	Provide direct, safe, attractive pedestrian access from project to transit stops and adjacent development.
CAP TCMs for local implementation^b	
1	Support Voluntary Employer-Based Trip Reduction Programs. The City and Port will explore ways to promote transit use and support employer-based trip reduction programs through development incentives such as density bonuses, reduced parking requirements, incentives for permanent bicycle facilities, etc. The City will encourage development of transit transfer stations near employment concentrations in the Gateway Development Area and 16 th /Wood sub-district.
9	Improve Bicycle Access and Facilities. Redevelopment includes extensive multi-use trails serving as both “spine” thoroughfares and “spurs” connecting main trails to the Oakland waterfront. The City and Port will encourage employers and developers to provide permanent bicycle facilities.
12	Improve Arterial Traffic Management. Maritime Street and other roadways in the project area will include facilities to encourage bicycling and walking. Roadways and intersections will be designed to operate at City-standard LOS, to facilitate traffic flow and avoid unnecessary queuing.
15	Local Clean Air plans, Policies and Programs. Redevelopment as presented in Chapter 3: Description, and including mitigation measures described in Chapter 4: Setting and Baseline, Impacts, and Mitigation, incorporates land uses such as live/work, and measures intended to reduce the number and length of single-occupant automobile trips.
17	Conduct Demonstration Projects. The City will encourage through development incentives demonstration projects for fleet electrification or alternative fueling. In addition, the Port will not preclude alternative fueling in its design of rail facilities.
19	Pedestrian Travel. OARB and Maritime sub-districts will include multi-use trails to encourage safe pedestrian travel.
20	Redevelopment will include traffic calming measures to the extent appropriate, consistent with the General Plan and sound traffic management of the project area.
^a Source: BAAQMD 1996, as amended through 1999. Based on Table 15: “Mitigation Measures for Reducing Motor Vehicle Emissions from Commercial, Institutional, and Industrial Projects” as modified by the OARB Redevelopment EIR.	
^b Source: BAAQMD CEQA Guidelines, revised 1999., Based on Table 5 as modified by the OARB Redevelopment EIR.	

These TCMs shall be coordinated with transportation demand management (TDM) measures implemented under Mitigation Measure Traf-14a, -14b, and 14c.

As shown in Table 4-5, Option B would exceed the significance threshold for ROG. Although the specific components or implementation methods of the recommended TCM program have not been determined, it is possible that implementation of Mitigation Measure Air-1 would substantially reduce the impact, potentially to levels of less than significant. However, since the components of this program have not yet been determined and their effectiveness on reducing project trip generation cannot be quantified, this analysis conservatively assumes that the emission of ROG would not be reduced to a less than significant level, and the residual impact is considered significant and unavoidable.

CARBON MONOXIDE EMISSIONS

Impact Air-2: **Permanent Local Impacts.** Project and Option B traffic would add to carbon monoxide concentrations near streets and intersections providing access to the site.

Significance: Less than Significant.

Mitigation: None required.

On the local scale, the project would change traffic on the local street network, changing carbon monoxide levels along roadways used by project traffic. Carbon monoxide is an odorless, colorless poisonous gas whose primary source in the Bay Area is automobiles. Concentrations of this gas are highest near intersections of major roads.

Carbon monoxide concentrations under worst-case meteorological conditions have been predicted for the most congested intersections affected by project traffic. PM peak traffic volumes were applied to a screening form of the CALINE 4 dispersion model to predict maximum 1- and 8-hour concentrations near these intersections with the addition of Project, Option B and cumulative traffic. A description of the model and a discussion of the methodology and assumptions used in the analysis is included in Appendix C. The model results were used to predict the maximum 1- and 8-hour concentrations, corresponding to the 1- and 8-hour averaging times specified in the state and federal ambient air quality standards for carbon monoxide. According to City of Oakland significance criteria, the impact would be considered significant if the project would contribute to CO concentrations exceeding the state ambient air quality standards of 9 ppm averaged over 8 hours and 20 ppm for 1 hour.

Table 4-7 shows that existing predicted concentrations near the intersections meet the 1-hour and 8-hour standards. Traffic from the Project and Option B would increase concentrations by up to 0.9 Parts Per Million (PPM), but concentrations with the Project or Option B traffic growth would not exceed the significance criteria. Concentrations in 2020 would be below current levels despite increased traffic due to anticipated reductions in per-mile emission rates as older, more polluting cars are replaced with newer, cleaner cars. This assumption is built into the air quality models.

Table 4-7

Worst Case Carbon Monoxide Concentrations Near Selected Intersections, Parts Per Million

Intersection	Existing (2006)		Project (2006)		Option B (2006)		Project + Cumulative (2020)		Option B + Cumulative (2020)	
	1-Hr	8-Hr	1-Hr	8-Hr	1-Hr	8-Hr	1-Hr	8-Hr	1-Hr	8-Hr
W. Grand/ Maritime	7.8	5.2	8.4	5.6	8.7	5.8	7.5	5.1	7.4	5.0
7 th Street/ Maritime	7.1	4.8	7.5	5.0	7.7	5.1	6.6	4.4	6.6	4.5
5 th Street/ Broadway	9.3	6.3	9.3	6.3	9.3	6.3	6.3	4.3	6.3	4.3
Powell/ I-80 NB Ramps	12.1	8.2	12.1	8.3	12.1	8.3	7.1	4.8	7.1	4.8
Powell/ Christie	12.2	8.3	12.2	8.3	12.2	8.3	7.0	4.8	7.0	4.8
Significance Criteria	20.0	9.0	20.0	9.0	20.0	9.0	20.0	9.0	20.0	9.0

Since Project traffic nor traffic from Option B would not cause any new violations of the 8-hour standards for carbon monoxide, nor contribute substantially to an existing or projected violation, project impacts on local carbon monoxide concentrations are considered to be less-than-significant.

DIESEL EMISSIONS

Impact Air-3: The proposed project could result in a substantial increase in diesel emissions.

Significance: Less than significant

Mitigation: Mitigation is not warranted

Diesel Particulate Matter (DPM) emissions from the project during operation would occur primarily from the delivery trucks that will be visiting the site. Based on the traffic report conducted for this project, daily traffic increases due to the project would be approximately 11,774 total vehicle trips by project buildout of 2007 (18,214 for Option B). To determine the proportion of new trips that would be truck trips, the general vehicle fleet percentages contained in URBEMIS 2002 were used. Likewise, the percentage of trucks within each weight class and the portion of these trucks that are fueled by diesel were also obtained from URBEMIS 2002. In 2007, when project operations would commence, there would be approximately 330 total daily truck trips (509 for Option B). Diesel exhaust emission rates for all diesel trucks were obtained from CARB's EMFAC2002 emissions model, assuming an average vehicle speed of 20 mph. Total emissions were calculated for a total distance of one mile, which includes one-half mile as the truck approaches the site and one-half mile as the truck leaves the site. The annual average DPM emissions for these truck-travel distances were estimated to be 25.4 lbs in 2007 for the project and 39.2lbs for Option B.

Annual average DPM concentration impacts from the delivery trucks operating near the site were calculated using the SCREEN3 model, and the incremental cancer risks were estimated from these concentrations. The estimated incremental DPM concentration at the site was calculated to be 0.0068 micrograms per cubic meter (0.0105 micrograms per cubic meter for Option B). As shown in Table 4-4, the background annual average PM_{2.5} concentrations in the area were recorded in 2003 as 12.5 micrograms per cubic meter at the Port of Oakland monitoring station (7th/Middle Harbor Road) and 9.9 micrograms per cubic meter at the West Oakland monitoring station (Filbert/24th Street).

The incremental cancer risk from exposure to the concentrations generated by project-related truck diesel emissions was estimated to be 2.1 in a million (3.3 in a million for Option B). Since these impacts are less than the BAAQMD significance threshold of 10 in a million, the impacts would be less than significant.

GAS STATION EMISSIONS

Impact Air-4: Gasoline Fueling Station Emissions. The project could contain a gasoline fueling station, which would be a new source of a Toxic Air Contaminants.

Significance: Less than significant

Mitigation: Mitigation is not warranted

The project could include a gasoline fueling station. Gasoline stations are a source of gasoline vapors that would include TACs such as benzene. Gasoline vapors are released during the filling of both the stationary underground storage tanks and the transfer from those underground tanks to individual vehicles. The BAAQMD has stringent requirements for the control of gasoline vapor emissions from gasoline dispensing facilities. District rules require all new facilities to install and maintain CARB Certified Vapor Recovery Systems. As a potential source of TACs, a gasoline filling station is subject to the BAAQMD's toxic risk screening and risk management procedures.

The project site is a substantial distance from any sensitive receptors. This fact and the above-described regulations and procedures, already established and enforced as part of the permit review process, would ensure that any potential impacts due to gasoline vapor emissions would be less-than-significant.

CUMULATIVE IMPACTS

Impact Air-5: As part of the cumulative growth of the OARB Area Redevelopment Plan, the Project or Option B, together with anticipated future development in the area, could result in long-term traffic increases and could cumulatively increase regional air pollutant emissions.

Significance: Potentially Significant for Project and Option B

Mitigation: Mitigation Measure Air-1, requiring fair share funding of feasible Transportation Control Measures (TCMs) would apply to the Project and Option B.

Residual Significance: Significant and Unavoidable for Project and Option B

Locally, emissions from project sources would be combined with emissions from other sources, primarily including area traffic (on local streets and freeways) from existing and future development throughout the project area vicinity. Although cumulative traffic volumes would increase by 2025, pollutant emissions from this increased traffic would be partly offset by the reductions in emission rates on a grams-per-mile basis. This is due to attrition of older and, higher polluting vehicles, improvements in overall automobile fleet, and improved fuel mixtures (as a result of on-going State and federal emissions standards and programs for on-road motor vehicles).

Cumulative Carbon Monoxide Emissions

Cumulative impacts on carbon monoxide concentrations at local intersections in 2025 would be less than significant as the worst-case carbon monoxide concentrations at all the analyzed intersections would be below the corresponding ambient standards.

Cumulative Regional Emissions

According to the BAAQMD CEQA Guidelines, any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. Table 4-5 shows that the operational emissions of ROG, NO_x and PM₁₀ due to project-related traffic estimated based on CARB's URBEMIS 2002 model would be less than the significance criteria of 80 pounds per day for the Project. Therefore the cumulative air quality impact of the project would be considered to be less-than-significant.

Operational emissions of NO_x and PM₁₀ under the Option B scenario would also be less than the significance criteria. However, operational emissions of ROG would be significant under the Option B scenario. Therefore the cumulative air quality impact of the project would be considered to be less-than-significant while the cumulative impact of Option B would be considered to be significant. Mitigation measure Air-1 would reduce Option B's individual impact, although not to a less-than-significant level.

Per BAAQMD significance criteria for cumulative impacts, increases in population and vehicle miles traveled due to the project must be accounted for in the regional CAP in order for the

project to have a less than significant cumulative impact. The recently adopted 2005 Bay Area Ozone Strategy prepared by the BAAQMD, MTC, and ABAG is based on population and employment projections for Oakland that assume redevelopment in the area under the OARB Redevelopment and Reuse Plans. The Project and Option B result in a change in use from that anticipated under the Reuse Plan and therefore may not be fully accounted for in the regional CAP.

Cumulative Diesel Emissions

As noted in the OARB Redevelopment EIR (pages 5-20 through -23) air pollutants would be emitted from ships, trains, trucks, and cargo equipment throughout the Redevelopment Area. That EIR concluded that taken together, these activities would increase exposure of pollutant-sensitive receptors in the West Oakland community to increased diesel emissions. As a component of implementation of the OARB Redevelopment Plan, both the project and Option B would contribute toward this previously identified cumulative impact.

The OARB Redevelopment EIR recommends three mitigation measures. The first, Measure 4.3-3, requires the Port to develop and implement a Criteria Pollutant Reduction Program aimed at reducing or offsetting Port-related emissions from its maritime and rail operations. The program is to be sufficiently funded to reduce and/or offset redevelopment-related contributions to local West Oakland air quality to the maximum extent feasible. The second, Measure 4.3-4, requires the City and the Port to jointly create, maintain, and fund on a fair share basis, a Truck Diesel Emission Reduction Program. This program is also to be sufficiently funded to reduce and/or offset redevelopment-related contributions to local West Oakland diesel emissions to the maximum extent feasible. The third, Measure 5.4-1, requires that the City and Port encourage, lobby and participate in emissions reduction demonstration programs. All of these mitigation measures include emission reduction strategies that have been previously analyzed by the Port (Port of Oakland, Berths 55-58 Project EIR) to determine technical, economic and legal feasibility.

With implementation of these mitigation measures the impacts would be substantially reduced, but it is not likely it would be reduced to a level that is less than significant, and the residual cumulative impact would be significant and unavoidable.

