APPENDIX C

Air Quality Report

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WAL-MART EXPANSION WILLIAMSON RANCH PLAZA
DRAFT AIR QUALITY STUDY
ANTIOCH, CALIFORNIA

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INTRODUCTION

This report assesses potential air quality impacts resulting from the proposed Wal-Mart expansion at Williamson Ranch Plaza in Antioch, California. The project proposes to expand the existing 141,498 square feet Wal-Mart by adding an additional 33,575 square feet. The project is located at the corner of Lone Tree Way and Hillcrest Avenue in Antioch, California.

This analysis evaluates the air quality impacts of the proposed project. The impact associated with the proposed development was evaluated in terms of operational and construction impacts to air quality. The primary focus of the air quality study was to evaluate future project-related emissions on regional air quality. This analysis was conducted following guidance provided by the Bay Area Air Quality Management District (BAAQMD)[1].

OVERALL REGULATORY SETTING

The Federal Clean Air Act governs air quality in the United States. In addition to being subject to Federal requirements, air quality in California is also governed by more stringent regulations under the California Clean Air Act. At the Federal level, the United States Environmental Protection Agency (USEPA) administers the Federal Clean Air Act. The California Clean Air Act is administered by the California Air Resources Board (CARB) at the State level and by the Air Quality Management Districts at the regional and local levels. The Bay Area Air Quality Management District (BAAQMD) regulates air quality at the regional level, which includes the nine-county Bay Area.

United States Environmental Protection Agency

The US EPA is responsible for enforcing the Federal CAA. The US EPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS). NAAQS are required under the 1977 Clean Air Act and subsequent amendments. The US EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. The agency has jurisdiction over emission sources outside state waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission standards established by CARB.

California Air Resources Board

In California, CARB which is part of the California Environmental Protection Agency, is responsible for meeting the state requirements of the Federal Clean Air Act, administering the California Clean Air Act, and establishing the California Ambient Air Quality Standards (CAAQS). The California Clean Air Act requires all air districts in the State to endeavor to achieve and maintain CAAQS. CARB regulates mobile air pollution sources, such as motor vehicles. The agency is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. CARB has established passenger vehicle fuel specifications and oversees the functions of local

[1] BAAQMD CEQA Guidelines for Assessing Air Quality Impacts from Projects and Plans, 1996, revised 1999.

air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level. CARB also conducts or supports research into the effects of air pollution on the public and develops innovative approaches to reducing air pollutant emissions.

Bay Area Air Quality Management District

BAAQMD is primarily responsible for assuring that the National and State ambient air quality standards are attained and maintained in the Bay Area. BAAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, conducting public education campaigns, as well as many other activities. BAAQMD has jurisdiction over much of the nine-county Bay Area counties.

National and State Ambient Air Quality Standards

As required by the Federal Clean Air Act, NAAQS have been established for six major air pollutants: carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O_3), respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), sulfur oxides, and lead. Pursuant to the California Clean Air Act, the State of California has also established ambient air quality standards. These standards are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. Both State and Federal standards are summarized in Table 1. The "primary" standards have been established to protect the public health. The "secondary" standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation and other aspects of the general welfare. CAAQS are more stringent than NAAQS. Thus, CAAQS are used as the comparative standard in this analysis.

Table 1 Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards [a]	
			Primary [b,c]	Secondary [b,d]
Ozone	8-hour	0.070 ppm	0.075 ppm	—
	1-hour	0.09 ppm	—[e]	Same as primary
Carbon monoxide	8-hour	9.0 ppm	9 ppm	—
	1-hour	20 ppm	35 ppm	—
Nitrogen dioxide	Annual	0.03 ppm	0.053 ppm	Same as primary
	1-hour	0.18 ppm	0.030 ppm	—
Sulfur dioxide	Annual	—	0.03 ppm	—
	24-hour	0.04 ppm	0.14 ppm	—
	3-hour	—	—	0.5 ppm
	1-hour	0.25 ppm	—	—
PM_{10}	Annual	20 $\mu g/m^3$	--[f]	Same as primary
	24-hour	50 $\mu g/m^3$	150 $\mu g/m^3$	Same as primary
$PM_{2.5}$	Annual	12 $\mu g/m^3$	15 $\mu g/m^3$	
	24-hour	—	35 $\mu g/m^3$ [f]	
Lead	Calendar quarter	—	1.5 $\mu g/m^3$	Same as primary
	30-day average	1.5 $\mu g/m^3$	—	—

Notes: (a) Standards, other than for ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

(b) Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.

(c) Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the EPA.

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

(e) The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005. A new 8-hour standard was established in May 2008.

(f) The annual PM_{10} standard was revoked by U.S. EPA on September 21, 2006 and a new $PM_{2.5}$ 24-hour standard was established.

PHYSICAL SETTING

The ambient air quality in a given area depends on the quantities of pollutants emitted within the area, transport of pollutants to and from surrounding areas, local and regional meteorological conditions, as well as the surrounding topography of the air basin. Air quality is described by the concentration of various pollutants in the atmosphere. Units of concentration are generally expressed in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The significance of a pollutant concentration is determined by comparing the concentration to an appropriate ambient air quality standard. The standards represent the allowable pollutant concentrations designed to ensure that the public health and welfare are protected, while including a reasonable margin of safety to protect the more sensitive individuals in the population.

Antioch is located in the eastern portion of the San Francisco Bay Area Air Basin. The air basin includes the counties of San Francisco, Santa Clara, San Mateo, Marin, Napa, Contra Costa, and Alameda, along with the southeast portion of Sonoma County and the southwest portion of Solano County. The local air quality regulatory agency responsible for this basin is the Bay Area Air Quality Management District (BAAQMD).

Climate and Topography

The project is located in Antioch, in the northeastern portion of Contra Costa County. The proximity of this location to both the Pacific Ocean, the San Francisco Bay, and the Delta has a moderating influence on the climate. Typical summer maximum temperatures for the region are in the 90's, while winter maximum temperatures are in the high 50's or low 60's. Minimum temperatures usually range from the high 50's in the summer to the 30's and low 40's in the winter. Annual rainfall in Antioch is only 10 to 15 inches, occurring mostly in the months of November through March. This low amount is due to the rain shadow effects of Mt Diablo and the surrounding high terrain southwest of Antioch. These mountains receive over twice as much rain.

Prevailing winds are from the west in the Carquinez Straits, particularly during the summer. During late spring, summer and early fall months, high pressure offshore, coupled with thermal low pressure in the Central Valley, affected by high inland temperatures, sets up a pressure pattern that draws marine air eastward through the Carquinez Straits almost every day. The wind is strongest in the afternoon, because that is when the pressure gradient between the semi-permanent high pressure offshore and the thermal low in the Central Valley is greatest. Afternoon wind speeds of 15 to 20 mph are common throughout the Carquinez Straits region, with gusty winds. Sometimes the pressure gradient reverses and flow from the east occurs. In the summer and fall months, this can cause elevated pollutant levels in the Bay Area. Typically, for this to occur, an area of high pressure is centered inland over the Great Basin or the Pacific Northwest. This displaces the thermal low to the west, setting up an east to west or northeast to southwest wind flow (an offshore flow event). These relatively infrequent offshore events have low wind speeds and shallow mixing depths, thereby allowing the localized emissions to build up. Furthermore, the air mass from the east is warmer, thereby increasing photochemical activity, and contains more pollutants than the usual maritime air blowing from the west. During the winter, easterly flow through the Carquinez Strait is more common. When migrating storm systems are not affecting California, inland high-pressure systems tend to be stronger than the high-pressure systems over the eastern Pacific Ocean. This results in an easterly flow of cool interior air from the Central Valley into the Bay Area through the Carquinez Strait.

Air quality standards for ozone traditionally are exceeded when relatively stagnant conditions in the region occur for periods of several days during the warmer months of the year. Weak wind flow patterns combined with strong inversions substantially reduces normal atmospheric mixing. Key components of ground-level ozone formation are sunlight and heat; therefore, significant ozone formation only occurs during the months from late spring through early fall. Prevailing winds during the summer and fall can transport and trap ozone precursors from the more urbanized portions of the Bay Area. The meteorological factors make air pollution potential in the project area quite high at times in summer are the persistent clear skies with relatively warm conditions that combine with transported and localized air pollutant emissions to elevate ozone levels. However, Antioch's proximity to the Carquinez Straits tends to result in more atmospheric mixing due to stronger winds and less stable atmospheric conditions. The strong typical winds in the Antioch area tend to transport localized emissions into the Central Valley and San Joaquin Valley air basins.

EXISTING AIR QUALITY CONDITIONS

Criteria Air Pollutants and Their Health Effects

Air quality studies generally focus on five pollutants that are most commonly measured and regulated. These are referred to as "criteria air pollutants," which include carbon monoxide (CO), ground level ozone, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and suspended particulate matter, i.e., PM_{10} and $PM_{2.5}$. In Contra Costa County, ozone and particulate matter are the pollutants of greatest concern since measured air pollutant levels exceed these concentrations at times.

<u>Carbon Monoxide.</u> CO, a colorless and odorless gas, interferes with the transfer of oxygen to the brain. It can cause dizziness and fatigue, and can impair central nervous system functions. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. Automobile exhaust and residential wood burning in fireplaces and woodstoves emit most of the CO in the Bay Area. CO is a non-reactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follows the spatial and temporal distributions of vehicular traffic. The highest CO concentrations measured in the Bay Area are typically recorded during the winter.

<u>Ozone.</u> While O_3 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. O_3 concentrations build to peak levels during periods of light winds, bright sunshine, and high temperatures. Short-term O_3 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 O_3 varies among individuals, but about 20 percent of the population is sensitive to O_3, with exercising children

being particularly vulnerable. O_3 is formed in the atmosphere by a complex series of photochemical reactions that involve "ozone precursors" that are two 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 NO_2, an oxide of nitrogen, is another criteria pollutant itself, ROGs are not in that category, but are included in this discussion as O_3 precursors. O_3 is present in relatively high concentrations within portions of the Bay Area on some days during late spring, summer and early autumn. Days with low wind speeds or stagnant air, warm temperatures, and cloudless skies are most likely to have high O_3 concentrations.

Nitrogen Dioxide. NO_2, a reddish-brown gas, irritates the lungs. It can cause breathing difficulties at high concentrations. Exposures to unhealthy levels of NO2 can lead to acute and chronic respiratory disease. Like O_3, NO_2 is not directly emitted, but is formed through a reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as NO_x and are major contributors to O_3 formation. NO_2 also contributes to the formation of PM_{10} (see discussion of PM_{10} below). Levels of NO_2 in the Bay Area are relatively low.

Sulfur Oxides. Sulfur oxides, primarily SO_2, are a product of high-sulfur fuel combustion. The main sources of SO_2 are coal and oil used in power stations, in industries, and for domestic heating. Industrial chemical manufacturing is another source of SO_2. SO_2 is an irritant gas that attacks the throat and lungs. It can cause acute respiratory symptoms and diminished ventilator function in children. Although there are refineries up wind of Antioch, SO_2 is found at low concentrations in eastern Contra Costa County.

PM_{10} and $PM_{2.5}$: Respirable particulate matter, PM_{10}, and fine particulate matter, $PM_{2.5}$, consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled and cause adverse health effects. PM_{10} and $PM_{2.5}$ are a health concern, particularly at levels above the Federal and State ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health because minute particles are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. Children are more susceptible to the health risks of $PM_{2.5}$ because their immune and respiratory systems are still developing. Very small particles of certain substances (e.g., sulfates and nitrates) can also directly cause lung damage or can contain absorbed gases (e.g., chlorides or ammonium) that may be injurious to health.

Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as mining and demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. In addition to being directly emitted, $PM_{2.5}$ is formed in the atmosphere from gases such as SO_2, NO_x, and volatile organic compounds (VOCs) that react to form aerosols. In addition to health effects, particulates also can damage materials and reduce visibility. Dust comprised of large particles (diameter greater than 10 microns) settles out rapidly and is more easily filtered by human breathing passages. This type of dust is considered more of a soiling nuisance rather than a health hazard.

In 1983, CARB replaced the standard for "suspended particulate matter" with a standard for suspended PM_{10} or "respirable particulate matter." This standard was set at 50 μg/m3 for a 24-hour average and 30 μg/m3 for an annual average. CARB revised the annual PM_{10} standard in 2002, pursuant to the Children's Environmental Health Protection Act. The revised PM_{10} standard is 20 $\mu g/m^3$ for an annual average. $PM_{2.5}$ standards were first promulgated by the EPA in 1997 and were recently revised in late 2006 to lower the 24-hour $PM_{2.5}$ standard to 35 $\mu g/m^3$ for 24-hour exposures. That same action by EPA revoked the annual PM_{10} standard due to lack of scientific evidence correlating long-term exposures of ambient PM_{10} with health effects. CARB has only adopted an annual average $PM_{2.5}$ standard, which is set at 12 $\mu g/m^3$. This is more stringent than the NAAQS of 15 $\mu g/m^3$.

Toxic Air Contaminants (TAC)

Besides the "criteria" air pollutants, there is another group of substances found in ambient air referred to as Hazardous Air Pollutants (HAPs) under the Federal Clean Air Act and Toxic Air Contaminants (TACs) under the California Clean Air Act. These contaminants tend to be localized and are found in relatively low concentrations in ambient air. However, they can result in adverse chronic health effects if exposure to low concentrations occurs for long periods. They are regulated at the local, State, and Federal level.

HAPs are the air contaminants identified by US EPA as known or suspected to cause cancer, serious illness, birth defects, or death. Many of these contaminants originate from human activities, such as fuel combustion and solvent use. Mobile source air toxics (MSATs) are a subset of the 188 HAPS. Of the 21 HAPs identified by EPA as MSATs, priority lists of six HAPs were identified that include: diesel exhaust, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene. While vehicle miles traveled in the United States is expected to increase by 64 percent over the period 2000 to 2020, emissions of MSATs are anticipated to decrease substantially as a result of efforts to control mobile source emissions (by 57 percent to 67 percent depending on the contaminant)[2].

California developed a program under the Tanner Toxics Act (AB 1807) to identify, characterize and control toxic air contaminants (TACs). Subsequently, AB 2728 incorporated all 188 HAPs into the AB 1807 process. TACs include all HAPs plus other contaminants identified by CARB. These are a broad class of compounds known to cause morbidity or mortality (cancer risk). TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and federal level.

Particulate matter from diesel exhaust is the predominant TAC in urban air and is estimated to represent about two-thirds of the cancer risk from TACs (based on the statewide average).

[2] Federal Highway Administration, 2006. Interim Guidance on Air Toxic Analysis in NEPA Documents.

According to CARB, diesel exhaust is a complex mixture of gases, vapors and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by ARB, and are listed as carcinogens either under State Proposition 65 or under the Federal Hazardous Air Pollutants programs.

CARB reports that recent air pollution studies have shown an association that diesel exhaust and other cancer-causing toxic air contaminants emitted from vehicles are responsible for much of the overall cancer risk from TACs in California. Particulate matter emitted from diesel-fueled engines (diesel particulate matter [DPM]) was found to comprise much of that risk. In August 1998, CARB formally identified DPM as a TAC. Diesel particulate matter is of particular concern since it can be distributed over large regions, thus leading to widespread public exposure. The particles emitted by diesel engines are coated with chemicals, many of which have been identified by EPA as HAPs, and by CARB as TACs. Diesel engines emit particulate matter at a rate about 20 times greater than comparable gasoline engines. The vast majority of diesel exhaust particles (over 90 percent) consist of $PM_{2.5}$, which are particles that can be inhaled deep into the lung. Like other particles of this size, a portion will eventually become trapped within the lung possibly leading to adverse health effects. While the gaseous portion of diesel exhaust also contains TACs, CARB's 1998 action was specific to DPM, which accounts for much of the cancer-causing potential from diesel exhaust. California has adopted a comprehensive diesel risk reduction program to reduce 2000 DPM emissions 85 percent by 2020. The U.S. EPA and CARB adopted low sulfur diesel fuel standards in 2006 that reduce diesel particulate matter substantially.

Smoke from residential wood combustion can be a source of TACs. Wood smoke is typically emitted during wintertime when dispersion conditions are poor. Localized high TAC concentrations can result when cold stagnant air traps smoke near the ground and, with no wind; the pollution can persist for many hours, especially in sheltered valleys during winter. Wood smoke also contains a significant amount of PM_{10} and $PM_{2.5}$. Wood smoke is an irritant and is implicated in worsening asthma and other chronic lung problems.

Exposure to TACs is usually evaluated in terms of health risk or cancer risk. For cancer health effects, the risk is expressed as the number of chances in a population of a million people who might be expected to get cancer over a 70-year lifetime. CARB estimates 2001 lifetime cancer risk at about 100 to 250 excess cases per million people in Antioch. This is a lower risk than the calculated overall 2000 San Francisco Bay Area basin-wide cancer risk of 480 cancer cases per million people. The cancer risk in Antioch is expected to be just above 100 cases per million people in 2010, and less than 100 cases per million if CARB adopts most of the diesel risk reduction measures. These estimates of lifetime cancer risk are based on emissions from major roadways, inventoried industrial and areas sources, and off road equipment (except aircraft).

While Antioch and the rest of eastern Contra Costa County have experienced substantial development since these maps were generated, levels of TACs in the air have decreased due to more stringent standards on automobiles, trucks, construction equipment and industry. The Federal Highway Administration reports that while vehicle miles traveled in the United States is expected to increase by 64% over the period 2000 to 2020, emissions of MSATs (mobile source air toxics) are anticipated to decrease substantially as a result of efforts to control mobile source emissions (by 57% to 67% depending on the contaminant)[3]. Although DPM is the greatest contributor to cancer risk posed by TACs, there are no reliable methods to measure airborne concentrations. However, CARB modeling data indicates composite exhaust emission rates of $PM_{2.5}$ in motor vehicles (indicative of DPM emissions) have decreased by 19 percent from 2000 through 2005. These emission rates are expected decrease 80 percent from 2000 through 2040.[4]

Air Monitoring Data

The BAAQMD monitors air quality conditions at over 30 locations throughout the Bay Area. The Pittsburg air monitoring station is the nearest station to Antioch, and thus is the most representative of air quality conditions at the project area. Criteria pollutants monitored include O_3, CO, NO_2, and PM_{10}. The gaseous pollutants (i.e., O_3, CO, and NO_2) are monitored continuously, while PM_{10} is sampled for 24 hours every sixth day. $PM_{2.5}$ is not measured at this site. A summary of the data recorded at this station is shown in Table 2 for the period 2003 through 2007.

Table 3 shows the number of days per year that air pollutant levels exceeded national or State standards in Pittsburg and the entire Bay Area monitoring network. The NAAQS for O_3 (8-hour concentrations) was exceeded once in 2006. No other exceedances of the NAAQS for O_3 have occurred at this station. The 1-hour CAAQS for O_3 was exceeded on 3 days in 2006 during a heat wave and one day in 2007. Exceedances of that standard did not occur in 2003 through 2005. The new State 8-hour O_3 standard was exceeded on 2 days in 2005, 10 days in 2006 and 2 days in 2007. Measured concentrations of CO and NO_2 did not exceed the NAAQS or CAAQS. Measured exceedances of the 24-hour PM_{10} State standard occurred on 1 to 4 sampling days annually during the 5-year period. $PM_{2.5}$ is not measured at this station.

Data from all stations throughout the Bay Area indicate that the 1-hour NAAQS for O_3 concentrations (recently revoked) was exceeded on one day in 2003. The 8-hour NAAQS for O_3 was exceeded 0 to 12 days annually. The more stringent State 1-hour O_3 standard was exceeded on 4 to 19 days annually and the new State 8-hour standard was exceeded on 9 to 22 days annually. The State PM_{10} standard was exceeded on 3 to 15 sampling days annually. The new 2006 $PM_{2.5}$ national standard was exceeded on 10 days in 2006 and 14 days in 2007.

[3] Federal Highway Administration, 2006. Interim Guidance on Air Toxic Analysis in NEPA Documents.
[4] Based on emission rates modeled with EMFAC2007/BURDEN for annual conditions in the Bay Area

Table 2 Highest Measured Air Pollutant Concentrations

Pollutant	Average Time	Measured Air Pollutant Levels				
		2003	2004	2005	2006	2007
Pittsburg						
Ozone (O_3)	1-Hour	0.09 ppm	0.09ppm	0.09 ppm	**0.11 ppm**	**0.10 ppm**
	8-Hour	0.08 ppm	0.08 ppm	0.08 ppm	**0.09 ppm**	0.07 ppm
Carbon Monoxide (CO)	8-Hour	1.7 ppm	1.9 ppm	1.7 ppm	1.9 ppm	1.5 ppm
Nitrogen Dioxide (NO_2)	1-Hour	0.06 ppm	0.05 ppm	0.06 ppm	0.05 ppm	0.05 ppm
	Annual	0.01 ppm	0.01 ppm	0.01 ppm	0.01 ppm	0.01 ppm
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	NA	NA	NA	NA	NA
	Annual	NA	NA	NA	NA	NA
Respirable Particulate Matter (PM_{10})	24-Hour	**58 µg/m3**	**64 µg/m3**	**57 µg/m3**	**59 µg/m3**	**59 µg/m3**
	Annual	NA	**22 µg/m3**	NA	20 µg/m3	19 µg/m3
Bay Area (Basin Summary)						
Ozone (O_3)	1-Hour	**0.12** ppm	**0.11** ppm	**0.12** ppm	**0.12** ppm	**0.12** ppm
	8-Hour	**0.10** ppm	**0.08** ppm	**0.09** ppm	**0.11 ppm**	**0.09 ppm**
Carbon Monoxide (CO)	8-Hour	4.0 ppm	3.4 ppm	3.1 ppm	2.9 ppm	2.7 ppm
Nitrogen Dioxide (NO_2)	1-Hour	0.09 ppm	0.07 ppm	0.07 ppm	0.11 ppm	0.07 ppm
	Annual	0.021ppm	0.019ppm	0.019ppm	0.018ppm	0.017ppm
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	56 ug/m^3	52 ug/m^3	55 ug/m^3	**75** ug/m^3	**58** ug/m^3
	Annual	12 ug/m^3	12 ug/m^3	12 ug/m^3	11 ug/m^3	11 ug/m^3
Respirable Particulate Matter (PM_{10})	1-Hour	**60** ug/m^3	**65** ug/m^3	**81** ug/m^3	**73** ug/m^3	**78** ug/m^3
	Annual	**25** ug/m^3	**26** ug/m^3	**24** ug/m^3	**23** ug/m^3	**26** ug/m^3

Source: BAAQMD Air Quality Summaries for 2003, 2004, 2005, 2006, and 2007.
Note: ppm = parts per million and ug/m^3 = micrograms per cubic meter
Values reported in bold exceed ambient air quality standard
NA = data not available.

Table 3 Annual Number of Days Exceeding Ambient Air Quality Standards

Pollutant	Standard	Monitoring Station	Days Exceeding Standard 2003	2004	2005	2006	2007
Ozone (O_3.)	NAAQS 1-hr	Pittsburg	0	0	–[1]	–[1]	–[1]
		BAY AREA	1	0	–[1]	–[1]	–[1]
	NAAQS 8-hr	Pittsburg	0	0	0	1	0
		BAY AREA	7	0	1	12	1
	CAAQS 1-hr	Pittsburg	0	0	0	3	1
		BAY AREA	19	7	9	18	4
	CAAQS 8-hr	Pittsburg	–[2]	–[2]	2	10	2
		BAY AREA	–[2]	–[2]	9	22	9
Respirable Particulate Matter (PM_{10})	NAAQS 24-hr	Pittsburg	0	0	0	0	0
		BAY AREA	0	0	0	0	0
	CAAQS 24-hr	Pittsburg	1	1	1	2	4
		BAY AREA	6	7	3	15	4
Fine Particulate Matter ($PM_{2.5}$)	NAAQS 24-hr [3]	Pittsburg	NA	NA	NA	NA	NA
		BAY AREA	0	1	0	10	14
All Other (CO, NO_2, Lead, SO_2)	All Other	Pittsburg	0	0	0	0	0
		BAY AREA	0	0	0	0	0

[1] Standard revoked in 2004.
[2] Standard not in place.
[3] Based on standard of 65 μg/m^3 that was in place until September 21, 2006, then 35 μg/m^3 standard in 2006.
NA = data not available.

Attainment Status

Areas that do not violate ambient air quality standards are considered to have attained the standard. Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant. The Bay Area as a whole does not meet either CAAQS or NAAQS for ground level O_3, or CAAQS for particulate matter (both PM_{10} and $PM_{2.5}$). For O_3, the entire Bay Area is designated as non-attainment at both the federal and State levels.

Under the federal CAA, the EPA has designated the region as marginally non-attainment for the 8-hour O_3 standard. EPA recently revised the standard slightly and will be making new attainment designations for this standard in about three years. Although EPA has determined that monitoring data for the Bay Area indicate attainment of the previous, but slightly higher standard, CARB and BAAQMD have not requested a change in the designation.

The U.S EPA lowered the 24-hour $PM_{2.5}$ standard from 65 μg/m^3 to 35 μg/m^3 in 2006. The EPA issued attainment status designations for the 35 μg/m^3 standard on December 22, 2008. The final

EPA order formally designating the Bay Area as nonattainment with the federal $PM_{2.5}$ standard will be effective in April 2009. The nonattainment designation is based on violations of the standard at air monitoring stations in Vallejo and San Jose. The BAAQMD will have until April 2012 to develop a plan for meeting the standard and will have until April 2014 to achieve compliance with the standard.

The Bay Area has met the CO standards for over a decade and is classified attainment maintenance by the US EPA. The US EPA grades the region as unclassified for all other air pollutants, including PM_{10}.

At the State level, the region is considered serious non-attainment for the 1-hour and 8-hour O_3 and non-attainment for PM_{10} and $PM_{2.5}$ standards. The region is required to adopt plans on a triennial basis that show progress toward meeting the State O_3 standard. There are no formal planning requirements for meeting the State $PM_{2.5}$ or PM_{10} standards. The area is considered attainment or unclassified for all other pollutants.

Bay Area Clean Air Plan

BAAQMD along with the other regional agencies (i.e., ABAG and MTC) has prepared an Ozone Attainment Plan to address the 1-hour NAAQS for ozone. Although U.S. EPA revoked the 1-hour NAAQS, commitments made in that plan along with emissions budgets remain valid until the region develops an attainment demonstration/maintenance plan for the 8-hour NAAQS for ozone. To be redesignated as attainment/maintenance for the ozone NAAQS, the region will be required to submit a maintenance plan and demonstration of attainment with a request for redesignation to the EPA. A Carbon Monoxide Maintenance Plan was approved in 1998 by EPA, which demonstrated how NAAQS for carbon monoxide standard would be maintained.

The *Bay Area 1991 Clean Air Plan* (CAP) is a plan to reduce ground-level ozone in the Bay Area in response to the California Clean Air Act. This CAP included a comprehensive strategy to reduce air pollutant emissions, focusing on control measures to be implemented during the 1991 to 1994 period. The plan also included control measures to be implemented from 1995 through the year 2000 and beyond. This plan is updated about every three years. The plans are meant to demonstrate progress toward meeting the more stringent 1-hour ozone CAAQS. The latest update to this plan, which was adopted in January 2006, is called the *Bay Area 2005 Ozone Strategy*. This plan includes a comprehensive strategy to reduce emissions from stationary, area, and mobile sources. The plan objective is to indicate how the region would make progress toward attaining the stricter state air quality standards, as mandated by the California Clean Air Act. The plan is designed to achieve a region-wide reduction of ozone precursor pollutants through the expeditious implementation of all feasible measures. The plan proposes expanded implementation of transportation control measures (TCMs) and programs such as Spare the Air. Spare the Air is a public outreach program designed to educate the public about air pollution in the Bay Area and promote individual behavior changes that improve air quality. Some of these measures or programs rely on local governments for implementation (e.g., BART offers free transit rides on Spare the Air days when funding is available).

The clean air planning efforts for ozone will also reduce PM_{10} and $PM_{2.5}$, since a substantial amount of this air pollutant comes from combustion emissions such as vehicle exhaust. In addition, BAAQMD adopts and enforces rules to reduce particulate matter emissions and develops public outreach programs to educate the public to reduce PM_{10} and $PM_{2.5}$ emissions (e.g., Spare the Night Program). SB 656 requires further action by CARB and air districts to reduce public exposure to PM_{10} and $PM_{2.5}$. Efforts identified by BAAQMD in response to SB656 are primarily targeting reductions in wood smoke emissions and adoption of new rules to further reduce NOx and particulate matter from internal combustion engines and reduce particulate matter from commercial charbroiling activities. BAAQMD recently adopted a rule addressing residential wood burning (Regulation 6, Rule 3). The rule restricts operation of any indoor or outdoor fireplace, fire pit, wood or pellet stove, masonry heater or fireplace insert on specific days during the winter when air quality conditions are forecasted to exceed the NAAQS for $PM_{2.5}$. The rule also limits excess visible emissions from wood burning devices and requires clean burning technology for wood burning devices sold (or resold) or installed in the Bay Area. NOx emissions contribute to ammonium nitrate formation that resides in the atmosphere as particulate matter, so a reduction in NOx emissions would reduce wintertime $PM_{2.5}$ levels. The Bay Area experiences the highest PM_{10} and $PM_{2.5}$ in winter when wood smoke and ammonium nitrate contributions to particulate matter are highest.

An update to the 1991 clean air plan (currently the *Bay Area 2005 Ozone Strategy*) is currently under development. This update is expected to be completed and adopted by the BAAQMD in late 2009. In addition to strategies to control ozone precursor emissions, the plan will likely include a multi-pollutant approach that also addresses particulate matter, and greenhouse gases.

Sensitive Receptors

There are groups of people more affected by air pollution than others. CARB has identified the following groups who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. Sensitive land uses near the project site include residential and park and recreational uses. The residential uses include the existing single-family homes north of the site and south of Lone Tree Way from the site. Park and recreational facilities in the immediate vicinity include: Knoll Park to the northwest of the site; Williamson Ranch Park on the opposite side of Lone Tree Way; and Prewitt Family Park located just west of the Williamson Ranch Plaza.

AIR QUALITY IMPACTS AND MITIGATIONS

Thresholds of Significance

Appendix G, of the CEQA Guidelines (Environmental Checklist) contains a list of project effects that may be considered significant. The project would result in a significant impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; and
- Create objectionable odors affecting a substantial number of people.

As provided by the State CEQA Guidelines, the CEQA Guidelines prepared by BAAQMD were applied to evaluate the significance of impacts resulting from the project. The following BAAQMD significance criteria are applied to provide greater specificity to several of the CEQA standards contained in Appendix G:

- A substantial net increase of any criteria pollutant, which is defined by BAAQMD as direct or indirect emissions of greater than 80 pounds per day for ROG, NOx, or PM_{10}. The BAAQMD CEQA Guidelines do not include thresholds for $PM_{2.5}$. The thresholds for PM_{10} are considered to be inclusive of $PM_{2.5}$, since PM_{10} particulates include $PM_{2.5}$.

- A substantial contribution to an existing or project violation of an ambient air quality standard would result if the project would cause an exceedance of the California Ambient Air Quality Standard for carbon monoxide of 9.0 parts per million over an 8-hour averaging period:

- Expose sensitive receptors or the general public to substantial pollutant concentrations. This is evaluated by assessing the health risk in terms of cancer risk or hazards posed by the placement of new sources of air pollutant emissions near existing sensitive receptors or placement of new sensitive receptors near existing sources. A significant impact would occur if the project results in probability of greater than 10 in one million that the Maximally Exposed Individual (MEI) will contract cancer.

- Create or expose a substantial number of people to objectionable odors.

The BAAQMD Guidelines recommend that cumulative impacts be evaluated based on the significance of operational air quality impacts and evaluation of the consistency of the project with the General Plan and of the General Plan with the Clean Air Plan.

Impact 1: Result in a substantial net increase of any criteria pollutant, which is defined by BAAQMD as direct or indirect emissions of greater than 80 pounds per day for ROG, NOx, or PM_{10}? *Less-than-significant*

The Bay Area is considered a non-attainment area for ground-level ozone under both the Federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for respirable particulates or particulate matter with a diameter of less than 10 micrometers (PM_{10}), and particulate matter with a diameter of less than 2.5 micrometers ($PM_{2.5}$) under the California Clean Air Act, but not the Federal Act. The area has attained both State and Federal ambient air quality standards for carbon monoxide. As part of an effort to attain and maintain ambient air quality standards for ozone and PM_{10}, BAAQMD has established thresholds of significance for air pollutants. These thresholds are for ozone precursor pollutants (reactive organic gases and nitrogen oxides) and PM_{10}. The Bay Area has attained carbon monoxide standards.

The project would add new traffic trips, which would lead to increased emissions of air pollutants. Emissions of air pollutants associated with the project were predicted using the URBEMIS2007 model (Version 9.2.4), distributed by the Rimpo Associates (*www.urbemis.com*) and recommended for use by BAAQMD. This model predicts daily emissions associated with land use developments. The model combines predicted daily traffic activity, associated with the different land use types, with emission factors from the State's mobile emission factor model (i.e., EMFAC2007). Kimley-Horn and Associates provided trip generation rates in the traffic report for the project. The model also predicts area source emissions associated with the proposed project, which are minor compared to emissions associated with traffic. For air quality modeling purposes, the project was anticipated to be fully operational in 2011. Project emissions are reported in Table 4. URBEMIS2007 computer output is provided in Appendix 1.

The proposed Wal-Mart expansion will add an additional 33,575 square feet to the existing Wal-Mart store that results in an additional of 1,590 daily trips. Development of the project expansion would increase emissions of ROG, NO_x, $PM_{2.5}$, and PM_{10}. As shown in Table 4, the combination of new vehicular travel and area sources predicted using the URBEMIS2007 model would not result in emissions that exceed BAAQMD significance thresholds, therefore this impact is *less-than-significant.* Note that $PM_{2.5}$ emissions were modeled at about 20 percent of the project PM_{10} emissions that are well below the BAAQMD significance thresholds.

Table 4 Daily Project Emissions for Implementation of the Wal-Mart Expansion Project in Pounds Per Day

	Modeled Daily Emissions in Pounds Per Day (lbs/day)			
Scenario	**Reactive Organic Gases (ROG)**	**Nitrogen Oxides (NOx)**	**Respirable Particulates (PM_{10})**	**Fine Particulates ($PM_{2.5}$)**
Net New Area Sources	<1	<1	<1	<1
Net New Mobile Sources	9	12	10	2
Net New Sources - Total	**10**	**13**	**10**	**2**
BAAQMD Significance Thresholds	*80*	*80*	*80*	--[1]

[1] The BAAQMD does not have PM2.5-based standards.

Stationary equipment that could emit air pollution has not been identified for the proposed project. Retail projects, such as this one, do not usually include these sources. If stationary sources are included in the project at a later date, they may require permits from BAAQMD. Such sources could include combustion emissions from standby emergency generators (rated 50 horsepower or greater). These sources would normally result in minor emissions, compared to those from traffic generation reported above. Sources of air pollutant emissions complying with all applicable BAAQMD regulations generally will not be considered to have a significant air quality impact. Stationary sources that are exempt from BAAQMD permit requirements due to low emission thresholds would not be considered to have a significant air quality impact.

Impact 2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation? *Less than significant*

Carbon monoxide emissions from traffic generated by the project would be the greatest pollutant concern at the local level. Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of carbon monoxide. Measured carbon monoxide levels have been at healthy levels (i.e., below State and Federal standards) in the Bay Area since the early 1990s. As a result, the region has been designated as attainment for the standard. Highest measured 8-hour carbon monoxide levels over the last 3 years are 1.9 ppm in Pittsburg (well below the federal and State standard of 9.0 ppm).

The contribution of project-generated traffic to these levels was predicted following the screening guidance recommended by the BAAQMD. A review of intersection traffic volumes and level of service was conducted to identify intersections with the potential for highest carbon monoxide levels that would be affected by the project. Four intersections were considered the worst intersections (in terms of elevated carbon monoxide levels from traffic) that may be affected by project-generated traffic. Future carbon monoxide levels were predicted near these intersections for existing conditions and future conditions with the project in place using traffic projections provided by Kimley-Horn and Associates. Emission factors used were calculated using the EMFAC2007 model, developed by the California Air Resources Board, with default assumptions for Contra Costa County during the winter, including a temperature of 40 degrees F. The highest CO concentrations occur winter during cold stable conditions with light winds. Therefore, modeling was conducted for wintertime conditions. A slow speed of 5 miles per hour was used on local streets and 25 miles per hour on the Route 4-Bypass, which results in higher emission rates. The screening analysis included the number of through lanes in the intersection configuration with a receptor located at the edge of the roadway. Results of this assessment are reported in Table 5. Screening calculations are provided in Appendix 2. Refined modeling using wider roadways that account for turn lanes would result in lower concentrations due to an increase in mixing zone width.

Table 5: Predicted Roadside 8-Hour Carbon Monoxide Concentrations

Description	Existing (2008)	Near-Term (2010)	Near-Term + Project (2010)	Far-Term (2025)	Far-Term + Project (2025)
Intersection 6: Lone Tree Way & Mokelumne Drive	3.5	3.9	4.0	2.1	2.1
Intersection 8: Lone Tree Way & Deer Valley Road	3.7	4.5	4.6	2.7	2.7
Intersection 14: Lone Tree Way & Hillcrest Avenue	4.6	4.7	4.7	3.0	3.0
Intersection 18: Lone Tree Way & SR-4 Bypass Ramps	6.4	6.8	6.8	3.7	3.7

Note: Includes background concentration of 1.9 ppm.

The highest 8-hour concentration with the project in place (in about 2010) is predicted to be 6.8 ppm over an 8-hour averaging period. This intersection would also be affected by Route 4 Bypass traffic and the project would not have a measurable effect. This represents the roadside concentration with Near-Term plus Project PM peak hour conditions, as reported by Kimley-Horn and Associates. Lower concentrations would occur at other intersections affected by project traffic. The analysis shows that the project would result in a slight increase in carbon monoxide levels at those other intersections. The results of this screening analysis indicate that project levels would be below the California ambient air quality standard (used to judge the significance of the impact) of 9.0 ppm; therefore, the impact is considered *less-than-significant*. Had levels been above the ambient air quality standards, a more refined analysis would have been conducted using the CALINE4 dispersion model and actual lane-receiver geometry. Note that cumulative conditions have lower concentrations, while there is more traffic. This is due to a substantial decrease in carbon monoxide tailpipe emissions that are expected from the entire vehicle fleet. New cleaner emitting vehicles are replacing older vehicles that have much higher emission rates.

Impact 4: Expose sensitive receptors to substantial pollutant concentrations (during project construction)? *Less than significant with mitigation*

Project construction would result in temporary emissions of dust and diesel exhaust. Emissions of diesel particulate matter emitted during construction are evaluated under Impact 5.

Dust would be generated during demolition, grading and construction activities. Most of the dust would result during grading activities and vehicle travel on unpaved areas. The amount of dust generated would be highly variable and is dependent on the size of the area disturbed, amount of activity, soil conditions and meteorological conditions. Most grading construction occurs during late spring through early fall when soil is dryer, which would result in the highest dust emissions. Typical winds during late spring through summer are from the west. Afternoon winds in late spring and summer can be quite gusty when soil conditions are dry. Nearby land uses include residential areas that could be adversely affected by dust generated from construction. In addition, construction dust emissions can contribute to regional PM_{10} emissions.

Although grading and construction activities would be temporary, they would have the potential to cause both nuisance and health air quality impacts. PM_{10} is the pollutant of greatest concern associated with dust. The BAAQMD does not have emission-based significance thresholds that apply to temporary construction activities. Instead, the BAAQMD CEQA Guidelines recommend application of appropriate dust control measures to reduce PM_{10} emissions from construction to avoid temporary significant impacts from construction. If uncontrolled, PM_{10} levels downwind of actively disturbed areas could possibly exceed State standards. In addition, dust fall on adjacent properties could be a nuisance. If uncontrolled, dust generated by grading and construction activities represents a *significant* impact.

Construction Mitigation Measure: Include BAAQMD recommended measures to control PM_{10} emissions during construction.

Implementation of the measures recommended by BAAQMD and listed below would reduce the air quality impacts associated with grading and new construction to a *less- than-significant* level. Measures to reduce diesel particulate matter and $PM_{2.5}$ from construction are recommended by the report preparer to ensure that short-term health impacts to nearby sensitive receptors are avoided.

Dust (PM_{10}) Control Measures:

1. Water all active construction areas at least twice daily and more often during windy periods. Active areas adjacent to residences should be kept damp at all times.

2. Cover all hauling trucks or maintain at least two feet of freeboard.

3. Pave, apply water at least twice daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas.

4. Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas and sweep streets daily (with water sweepers) if visible soil material is deposited onto the adjacent roads.

5. Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (i.e., previously-graded areas that are inactive for 10 days or more).

6. Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles.

7. Limit traffic speeds on any unpaved roads to 15 mph.

8. Replant vegetation in disturbed areas as quickly as possible.

9. Suspend construction activities that cause visible dust plumes to extend beyond the construction site.

Measures to reduce diesel particulate matter and $PM_{2.5}$ from construction

10. Diesel equipment standing idle for more than five minutes shall be turned off. This would include trucks waiting to deliver or receive soil, aggregate, or other bulk materials. Rotating drum concrete trucks could keep their engines running continuously as long as they were onsite. Signs describing idling restrictions shall be conspicuously posted at the construction site.

11. Prohibit equipment with dirty emissions. The project shall ensure that emissions from all off-road diesel powered equipment used on the project site do not exceed 40 percent opacity for more than three minutes in any one hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) shall be repaired immediately. This measure means that equipment with continuous dark emissions would be in violation of the requirement.

12. Properly tune and maintain equipment for low emissions.

13. Use electrical power, rather than diesel powered generators.

Impact 5: Exposure of Sensitive Receptors to Toxic Air Contaminants from construction and operation of the project. *Less than significant*

Diesel particulate matter (DPM) would be emitted from diesel-fueled vehicles and equipment during construction activities and from vehicle traffic attracted by the proposed project while operational. The particulate matter component of diesel exhaust has been classified as a TAC by CARB based on its potential to cause cancer and other adverse health effects. A health risk evaluation was conducted to assess the potential health effects of the proposed project's DPM emissions on nearby sensitive receptors.

Additionally, polycyclic aromatic hydrocarbons (PAHs) would be emitted in small quantities from the one fast-food restaurant (McDonalds) at the project. PAHs are a group of over 100 chemicals and can be produced from cooking meat with charbroilers or griddles. PAHs are also classified as a TAC with the potential to cause cancer. Since the fast-food restaurant in the project involves the relocation of the existing fast-food restaurant within a remodeled portion of the existing store, it is not expected that there would be a net increase in PAH emissions associated with the project. Therefore, the health risk assessment for the project expansion did not include an assessment of PAH emissions.

The highest daily levels of DPM would be emitted during construction activities due to use of heavy-duty diesel equipment such as bulldozers, excavators, loaders, graders and diesel-fueled haul trucks. However, these emissions would be intermittent, vary throughout the project site area, and be of a relatively short duration (less than six months of heavy construction activity). In contrast, low-level DPM emissions would result from project operation but they would be constant over the lifetime of the project. Retail-related operational DPM emissions would result from large diesel-fueled trucks making merchandise and grocery deliveries to the proposed project, in addition to DPM emissions from a small fraction of customer motor vehicles that would be diesel fueled. DPM emissions from retail operation are assumed to occur over a 70-year exposure period.

DPM emissions from construction activities were estimated using the URBEMIS2007 model, discussed previously, based on an estimated schedule for construction activities (grading and construction) and types of equipment expected to be used. Emissions from other vehicles during retail operations (e.g., customer and employee vehicles) were estimated using emission factors for diesel-fueled vehicles from the CARB's EMFAC2007 model. (Note: The DPM emission rates do not factor-in emission-reduction measures, which have been or will be implemented for construction equipment fleets.)

DPM emissions from project-related delivery trucks will occur at the project site from trucks driving within the site to make deliveries, during idling when not moving or unloading, and from operation of truck transportation refrigeration units (TRUs) on trucks carrying perishable products. There will be an average of up to about 22 delivery trucks accessing the expanded Wal-Mart on a daily basis compared to about 15 trucks per day for the existing Wal-Mart store. Of the 22 trucks anticipated, 10 will be heavy duty 4-axle trucks, with 2 of these trucks equipped with TRUs, and 12 lighter duty 2-axle trucks. The existing store has up to about 8 heavy duty 4-axle trucks and 7 light duty 2-axle trucks making deliveries each day. All of these trucks were assumed to be diesel-fueled. (Note: For purposes of this analysis, the increased truck delivery numbers above are slightly higher than those indicated by the applicant in order to present a worst-case analysis.)

Emissions of DPM from delivery trucks were estimated for both the existing store and the proposed expanded store using mobile source emission factors from the CARB EMFAC2007 emissions model. Emission factors for idling, traveling on site as slow speed (15 mph), and while traveling off site in the project vicinity on local roads at speeds of 35 mph were obtained from the model. TRU emissions were based on CARBs DPM emission standards for TRUs (title 13, CCR, section 2477) and an average TRU generator size of 34 horsepower[5]. Details on the DPM emission factors used and emission calculations are provided in Appendix 3. (Note: The DPM emission rates do not factor-in emission-reduction measures, which have been or may be implemented for retailer truck fleets.)

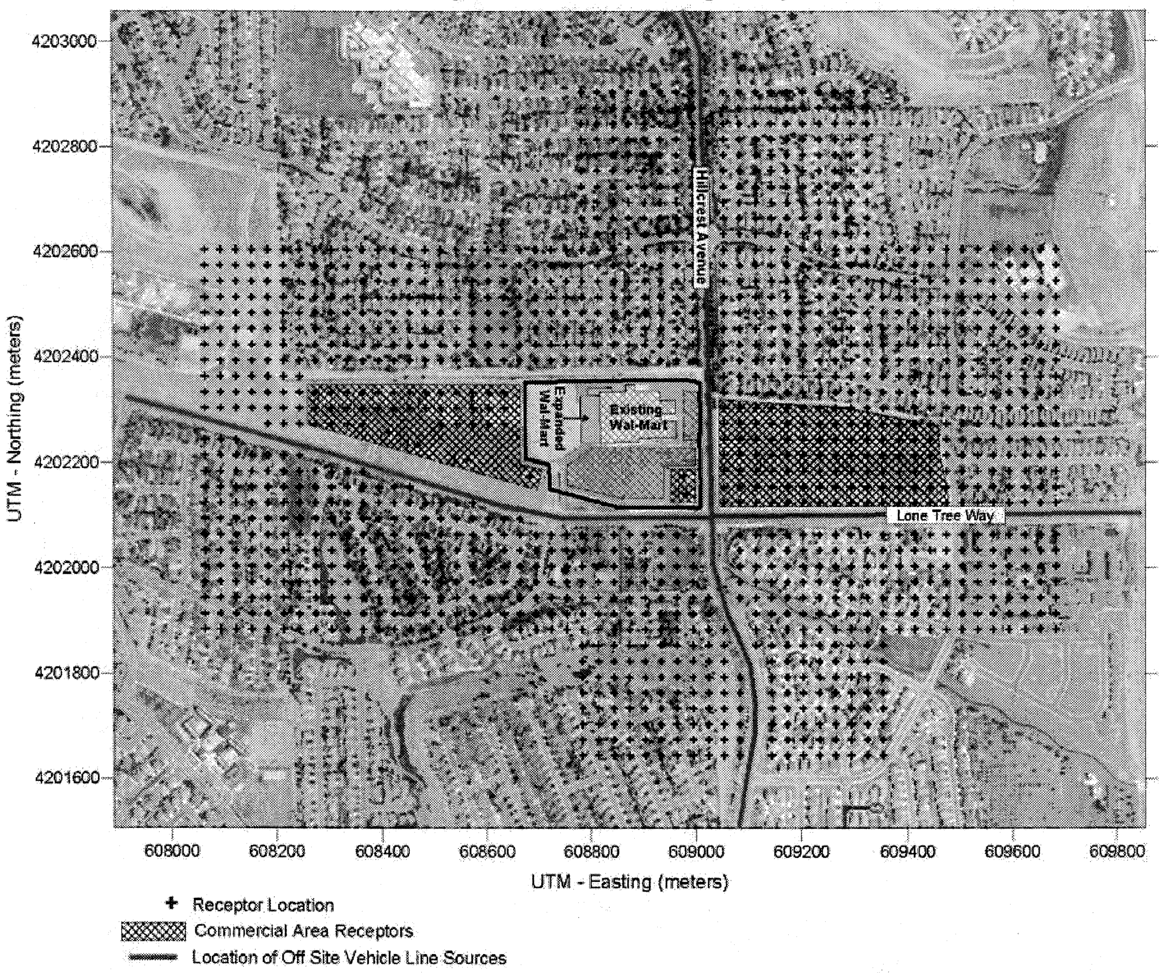
Some of the project-generated trips from customers and employees would be from diesel-powered vehicles. Like delivery trucks, these would have emissions from both on-site and travel to and from the site. DPM emissions from these vehicles were modeled on-site and while they traveled along Lone Tree Way and Hillcrest Avenue near the site. The project is predicted to generate about 8,901 daily trips, 1,606 more daily trips than are made to the existing store. Most of these trips would be light-duty automobiles or light-duty trucks and a small percentage would be considered medium-duty trucks. Large trucks used to deliver merchandise or serve the site were modeled as described above.

[5] CARB 2003. Airborne Toxic Control Measure for In-Use Diesel-Fueled Transportation Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate. Staff Report: Initial Statement of Reasons for Proposed Rulemaking.

Potential cancer risks from on and off site project-related DPM emission sources were calculated using screening-level health risk assessment procedures. Cancer risks were calculated using health risk assessment methods recommended by the California Office of Environmental Health Hazard Assessment (OEHHA) and the BAAQMD. This involves calculation of ambient DPM concentrations at sensitive receptor locations (nearby residences) and other locations where exposure may occur (e.g., workers in nearby commercial/retail areas and in the existing Wal-Mart store) using an air quality dispersion model, then calculating cancer risks using the modeled concentrations along with appropriate DPM-specific risk factors. This method was used to assess cancer risks from all DPM emission sources (construction activities, on and off site project-generated vehicle and delivery truck travel, on site TRU operation, and from on site project-generated vehicle travel). Additional details on DPM emissions and emission sources used in the refined health risk assessment are provided in Appendix 3.

As discussed earlier, the closest residences (Parkside neighborhood) are about 120 feet from the project site on the northern side of East Antioch Creek, which is adjacent to the project site. Other nearby residences are located along Hillcrest Avenue to the northeast of the site, and along Lone Tree Way to the south of the site. A commercial area, with retail, professional offices, and restaurant uses, is directly west of the project site. Another commercial area is situated east of the project site, on the east side of Hillcrest Avenue. In modeling DPM concentrations from project emission sources, a grid of receptors, spaced every 30 meters, was used for the residential areas near the project site and along Hillcrest Avenue and Lone Tree Way in the vicinity of the project. Additional receptors, used to represent locations of potential off site worker exposure, were placed at building locations within the commercial areas adjacent to the Wal-Mart store area. Receptors within the existing Wal-Mart store spaced every 15 meters were also used to evaluate potential effects on on-site workers. Figure 1 shows the project site and its relationship to the residential and commercial area receptors where DPM concentrations were calculated and used for the health risk analysis.

Figure 1
Project Area and Modeling Receptors



The EPA's Industrial Source Complex Short-Term (ISCST3) dispersion model was used, along with screening meteorological data from the EPA's SCREEN3 model, to calculate screening-level DPM concentrations at sensitive receptor locations in the project vicinity. The ISCST3 model calculates pollutant concentrations at receptors located in areas of flat or complex terrain from a variety of emission source types including point, area, volume and line sources. The model was run using regulatory default dispersion options and urban dispersion coefficients due to the urban nature of the project area. Since there is little variation in terrain elevation in the project vicinity the model was run in flat terrain mode.

The screening meteorological data used in the modeling are based on the meteorological conditions used with by the SCREEN3 model. These meteorological data are comprised of 54 combinations of wind speed and atmospheric stability that represent meteorological conditions that may exist over a 24-hour period (daytime and nighttime conditions). Using this meteorological data the ISCST3 model was used to compute 1-hour average concentrations at each receptor location. The 1-hour concentrations were converted to annual average concentrations, needed for evaluation of cancer risks, by applying the BAAQMD recommended conversion factor of 0.1 to the 1-hour concentrations.

The off site project-related vehicle and delivery truck DPM emissions were modeled as line sources (a series of volume sources along a path) along Lone Tree Way and Hillcrest Avenue near the project site. Emissions from delivery trucks while traveling on site were also modeled as line sources, while the truck emissions during idling and from the TRUs were modeled as point sources. For the proposed store expansion delivery trucks were assumed to use the new loading dock. Delivery trucks for the existing store were assumed to use the existing loading dock. On site project-related vehicle traffic was modeled as a series of area sources distributed throughout the project site covering the internal roads and parking areas. The locations of these emissions sources are depicted on Figure 2. DPM emissions from construction were modeled as area sources encompassing the construction area.

DPM emissions from both the existing store and for the proposed store expansion were modeled in order to identify potential changes in local DPM concentrations and associated changes to cancer risks. Potential incremental cancer risks at the residential and site worker receptor locations were calculated using standard risk assessment methodology as recommended by the BAAQMD and OEHHA. Potential non-cancer health effects due to chronic exposure to DPM were not estimated since the concentration threshold for non-cancer risks is considerably higher than concentrations that would result in significant cancer risks.

Cancer risks were evaluated following OEHHA Air Toxics Hot Spot Program Risk Assessment Guidelines (OEHHA 2003) and BAAQMD exposure parameters. Potential cancer risks from DPM emissions were calculated for both residential and non-residential (workers in the other commercial/retail facilities in the project vicinity and at the existing Wal-Mart store) exposures. Consistent with BAAQMD Guidance, residential exposures were assumed to be continuous for 24 hours per day, 350 days per year, over a period of 70 years, at a breathing rate of 302 liters per day per kilogram of body weight (L/kg-day). Workers were assumed to be exposed for 8 hours per day, 245 days per year, over a period of 40 years, at a breathing rate of 149 L/kg-day. Since DPM emissions during construction would be less than one year, the exposures were adjusted to account for one year of exposure out of an overall 70-year exposure period. Details of the cancer risk calculations are provided in Appendix 3.

Table 6 summarizes the potential maximum increased cancer risks for residential and on- and off-site worker exposures due to DPM emissions from the project. Off-site worker and residential cancer risks are highest for receptor locations closest to the existing Wal-Mart and proposed expanded Wal-Mart, then decrease as the distance from the store increases. The maximum residential cancer risk, which is quite low, occurs at the residence closest to the existing Wal-Mart store on the west side of Hillcrest Avenue. The maximum cancer risk for an off-site worker exposure occurs east of the proposed expanded Wal-Mart, at the Orchard Supply Hardware store. These cancer risks represent the potential increase in the number of cancer cases per million persons that would result from expanding the existing Wal-Mart store. Since the projected maximum increased cancer risks associated with DPM for both residential and worker exposures are less than the BAAQMD significance threshold of 10 in a million, the impact would be considered *less than significant.*

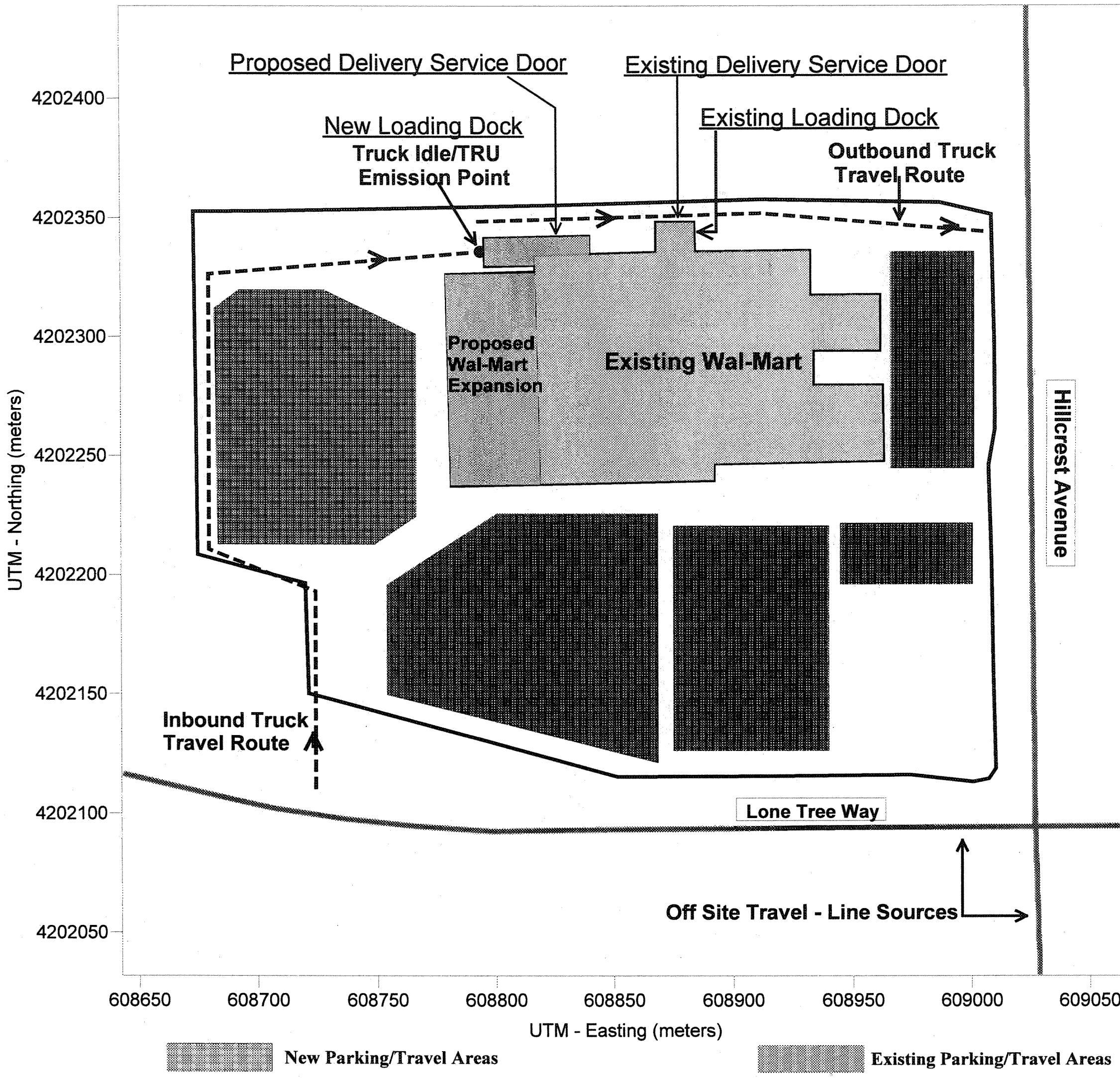
Table 6 – Increased Cancer Risks From Proposed Wal-Mart Expansion Project

	Maximum Increased Cancer Risk (per million persons)		
Store Condition	**Off-Site Worker Exposure**	**Existing (Wal-Mart) Worker Exposure**	**Residential Exposure**
Proposed Expanded Wal-Mart Store [a]	2.85	2.04	2.25
Existing Wal-Mart Store[b]	0.96	1.16	2.18
Net Increased Cancer Risk	**1.89**	**0.88**	**0.07**

[a] Includes cancer risks from construction and operation. Note: This includes the entire Wal-Mart store, as proposed to be expanded.

[b] Cancer risks from operation. Note: This line is subtracted from the first line to derive net change in cancer risks resulting from the store expansion.

Figure 2
Proposed Antioch Wal-Mart Expansion
Emission Source Locations



Impact 6: Create objectionable odors affecting a substantial number of people? *Significant*

During construction, the various diesel powered vehicles and equipment in use onsite would create localized odors. These odors would be temporary and not likely to be noticeable for extended periods of time much beyond the project's site boundaries. The potential for diesel odor impacts is therefore *less than significant.*

During project operations, the project could produce odors as a result of refuse storage and collection, the operation of the tire and lube facility, and from cooking exhaust at the fast-food restaurant. However, these activities all currently occur at the existing Wal-Mart store. The refuse storage and collection area will be expanded somewhat to accommodate increased solid waste generation by the expanded store, but all collection areas and containers will be enclosed to minimize generation of odors. The tire and lube facility, which will not be altered, does not generate noticeable odors beyond the project boundaries. Therefore, the odor impacts associated with refuse store and collection, and the tire and lube facility, would be *less than significant*.

The existing fast-food restaurant inside the Wal-Mart store will be relocated within the store. This restaurant is a potential source for cooking odors. Reaction to cooking odors varies widely with individuals. Some people find them objectionable, while others find them pleasant. Restaurant cooking odors have, in some instances, been the subject of complaints, although no complaints have been received by the City of Antioch from the existing fast-food restaurant at the existing Antioch Walmart store. A potential for odor nuisance exists during light wind conditions. This is considered to be a *potentially significant impact*.

Odor Mitigation Measure. The fast-food restaurant in the project shall install kitchen exhaust vents in accordance with accepted engineering practice, and shall install exhaust filtration systems or other accepted methods of odor reduction.

The combination of dilution and odor removal through filtration would effectively reduce odor strength to levels that would not cause frequent complaints.

Impact 6: Conflict with or obstruct implementation of the applicable air quality plan? *No Impact*

Project site has been planned for commercial retail use in successive general plans and specific plans dating back to 1982. The planned retail land use for the project site would have been used in the City growth projections contained in successive air quality plans prepared by the Bay Area Air Quality Management District. Therefore, the project would not conflict with projections used to prepare the latest clean air plan (i.e., Bay Area 2005 Ozone Strategy) or obstruct its implementation. This project has no impact.

CUMULATIVE IMPACTS

Cumulative air quality impacts are evaluated based on both a quantification of the project-related air quality impacts and the consistency of the proposed project and applicable General Plan with regional air quality plans. In addition, review of the project for consistency with the regional air quality plan takes into consideration the cumulative nature of the air quality plan, which is based on area-wide growth assumptions.

Regional Air Pollutant Emissions

The project itself would have emissions that are below the BAAQMD CEQA Guidelines thresholds that are used to determine if a project would have a significant impact in terms of ozone and PM_{10}. According to the BAAQMD CEQA Guidelines, when a project does not individually result in significant operational air quality impacts, the determination of a significant cumulative impact is to be based on an evaluation of the consistency of the project with the local general plan and of the general plan with the regional air quality. As described under Impact 6, the project is consistent with the Antioch General Plan, which in turn is consistent with the regional Clean Air Plan, and therefore the project would not conflict with the regional Clean Air Plan. As a result, the project would not significantly contribute to a cumulatively significant impact to regional air quality.

Local Air Pollutant Emissions

Construction period PM_{10} emissions would be localized. With implementation of the Construction Mitigation Measure, construction period impacts would be less than significant. Additional construction at other project sites that may occur in the area simultaneously with the proposed project would be less than significant since construction impacts are localized to the immediate area surrounding the construction site and significant interaction of emissions from different sites would not be expected to occur. Therefore, cumulative construction emissions would not be significant.

The CO analysis was performed based on traffic data which incorporates the cumulative development projects in the base condition. Therefore, the results of the project-specific CO analysis, discussed under Impact 5 above, actually reflect cumulative CO levels. Since CO levels at the worst affected intersections are predicted to be well below the applicable federal and State standards, the cumulative CO emissions would be less-than-significant.

Cumulative Toxic Air Pollutant Impacts

Potential cumulative toxic air pollutant impacts can result from interaction of the proposed Wal-Mart expansion project with other approved or planned projects that could have emissions of toxic air pollutants and would be operational within the timeframe of the proposed project. Two other projects, the Lone Tree Landing and Williamson Ranch Plaza projects (which both have been substantially completed but have undeveloped phases remaining), have been identified that have the potential to cumulatively interact with the proposed project. Other projects farther away were not considered since DPM emissions are highly localized and disperse quickly with distance from the source. Therefore, DPM emissions from other projects not in the immediate project vicinity would have negligible concentrations at the project site and would not combine with project emissions to result in a cumulatively significant health risk.

The Lone Tree Landing is located across Hillcrest Avenue to the east from the Wal-Mart site. The retail floor area approved for the final phase of this project is 25,000 square feet; plus there is a completed but unoccupied 8,713 square feet of retail space and 9,595 square feet of office space, for a total approved but unoccupied area of 43,308 square feet. Once this project is occupied and operational, it will generate an average of about 3 daily 2-axle diesel truck deliveries, but no 4-axle truck deliveries or trucks with TRUs. The final phase of the other project, the Williamson Ranch Plaza - Phase IV, consists of 20,030 square feet of approved office development located at the western end of the same shopping center where Wal-Mart is located. It is not expected that this development would have large diesel truck making deliveries to its occupants on a regular basis.

The primary sources of diesel particulate matter emissions from retail and commercial developments are large diesel-fueled delivery trucks and trucks with TRUs. Because of the low level of truck activity that will be associated with the final phases of the Lone Tree Landing and the Williamson Ranch Plaza projects, these projects would not be considered to expose sensitive receptors to substantial levels of toxic air contaminants. Combined with the relatively low DPM emissions associated with the proposed project, the combined emissions from these proximate projects would also be relatively low and the health risk associated with these cumulative DPM emissions would not exceed the significance threshold of 10 increased cancer cases per 1 million population. Thus, cumulative exposure to toxic air pollutants from these nearby projects and the proposed Wal-Mart expansion project would be considered less than significant.

The project would not contribute to a local cumulative air quality impact with respect to carbon monoxide, particulate, or health risk due to TAC exposure. In addition, the project is consistent with the Antioch General Plan, which in turn is consistent with the regional Clean Air Plan, and as such the project would not conflict with the regional Clean Air Plan; therefore, the project would not have a cumulatively significant impact on regional air quality. In conclusion, the project would not have a cumulatively significant impact on air quality.

Appendix 1 URBEMIS2007 Output

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: Z:\I&R Docs\08-138 Antioch Wal-Mart Expansion\AQ\Antioch WM Expansion Urbemis.urb924

Project Name: Antioch Walmart Existing

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	72.71	42.81	22.99	0.01	9.21	2.13	11.34	1.92	1.96	3.88	4,165.78

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.38	0.41	1.87	0.00	0.01	0.01	466.46

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	9.21	12.15	120.78	0.11	9.87	2.11	11,447.47

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	9.59	12.56	122.65	0.11	9.88	2.12	11,913.93

Construction Unmitigated Detail Report:

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CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 6/1/2010-7/14/2010 Active Days: 32	3.04	25.05	13.62	0.00	9.20	1.25	10.46	1.92	1.15	3.07	2,349.23
Fine Grading 06/01/2010-07/15/2010	3.04	25.05	13.62	0.00	9.20	1.25	10.46	1.92	1.15	3.07	2,349.23
Fine Grading Dust	0.00	0.00	0.00	0.00	9.20	0.00	9.20	1.92	0.00	1.92	0.00
Fine Grading Off Road Diesel	3.00	24.99	12.46	0.00	0.00	1.25	1.25	0.00	1.15	1.15	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.07	1.16	0.00	0.00	0.00	0.01	0.00	0.00	0.00	101.91
Time Slice 7/15/2010-7/15/2010 Active Days: 1	5.14	**42.81**	**22.99**	0.00	**9.21**	**2.13**	**11.34**	**1.92**	**1.96**	**3.88**	**4,165.78**
Fine Grading 06/01/2010-07/15/2010	3.04	25.05	13.62	0.00	9.20	1.25	10.46	1.92	1.15	3.07	2,349.23
Fine Grading Dust	0.00	0.00	0.00	0.00	9.20	0.00	9.20	1.92	0.00	1.92	0.00
Fine Grading Off Road Diesel	3.00	24.99	12.46	0.00	0.00	1.25	1.25	0.00	1.15	1.15	2,247.32
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.04	0.07	1.16	0.00	0.00	0.00	0.01	0.00	0.00	0.00	101.91
Trenching 07/15/2010-08/01/2010	2.10	17.75	9.37	0.00	0.00	0.88	0.88	0.00	0.81	0.81	1,816.55
Trenching Off Road Diesel	2.06	17.69	8.22	0.00	0.00	0.88	0.88	0.00	0.81	0.81	1,714.64
Trenching Worker Trips	0.04	0.07	1.16	0.00	0.00	0.00	0.01	0.00	0.00	0.00	101.91
Time Slice 7/16/2010-7/30/2010 Active Days: 11	2.10	17.75	9.37	0.00	0.00	0.88	0.88	0.00	0.81	0.81	1,816.55
Trenching 07/15/2010-08/01/2010	2.10	17.75	9.37	0.00	0.00	0.88	0.88	0.00	0.81	0.81	1,816.55
Trenching Off Road Diesel	2.06	17.69	8.22	0.00	0.00	0.88	0.88	0.00	0.81	0.81	1,714.64
Trenching Worker Trips	0.04	0.07	1.16	0.00	0.00	0.00	0.01	0.00	0.00	0.00	101.91

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Time Slice 8/2/2010-8/31/2010 Active Days: 22	2.08	12.17	9.06	0.00	0.01	1.04	1.05	0.00	0.95	0.96	1,180.45
Asphalt 08/01/2010-09/01/2010	2.08	12.17	9.06	0.00	0.01	1.04	1.05	0.00	0.95	0.96	1,180.45
Paving Off-Gas	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.95	11.89	6.98	0.00	0.00	1.03	1.03	0.00	0.94	0.94	979.23
Paving On Road Diesel	0.01	0.16	0.05	0.00	0.00	0.01	0.01	0.00	0.01	0.01	22.88
Paving Worker Trips	0.07	0.11	2.03	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.35
Time Slice 9/1/2010-9/1/2010 Active Days: 1	3.40	21.82	17.10	**0.01**	0.02	1.63	1.66	0.01	1.50	1.51	2,399.06
Asphalt 08/01/2010-09/01/2010	2.08	12.17	9.06	0.00	0.01	1.04	1.05	0.00	0.95	0.96	1,180.45
Paving Off-Gas	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.95	11.89	6.98	0.00	0.00	1.03	1.03	0.00	0.94	0.94	979.23
Paving On Road Diesel	0.01	0.16	0.05	0.00	0.00	0.01	0.01	0.00	0.01	0.01	22.88
Paving Worker Trips	0.07	0.11	2.03	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.35
Building 09/01/2010-10/15/2010	1.33	9.65	8.04	0.00	0.02	0.59	0.61	0.01	0.55	0.55	1,218.62
Building Off Road Diesel	1.21	9.16	4.81	0.00	0.00	0.58	0.58	0.00	0.53	0.53	893.39
Building Vendor Trips	0.02	0.32	0.26	0.00	0.00	0.01	0.01	0.00	0.01	0.01	64.53
Building Worker Trips	0.10	0.17	2.96	0.00	0.01	0.01	0.02	0.00	0.01	0.01	260.70
Time Slice 9/2/2010-10/14/2010 Active Days: 31	1.33	9.65	8.04	0.00	0.02	0.59	0.61	0.01	0.55	0.55	1,218.62
Building 09/01/2010-10/15/2010	1.33	9.65	8.04	0.00	0.02	0.59	0.61	0.01	0.55	0.55	1,218.62
Building Off Road Diesel	1.21	9.16	4.81	0.00	0.00	0.58	0.58	0.00	0.53	0.53	893.39
Building Vendor Trips	0.02	0.32	0.26	0.00	0.00	0.01	0.01	0.00	0.01	0.01	64.53
Building Worker Trips	0.10	0.17	2.96	0.00	0.01	0.01	0.02	0.00	0.01	0.01	260.70

Time Slice 10/15/2010-10/15/2010 Active Days: 1	**72.71**	9.71	9.00	0.00	0.02	0.60	0.62	0.01	0.55	0.55	1,303.48
Building 09/01/2010-10/15/2010	1.33	9.65	8.04	0.00	0.02	0.59	0.61	0.01	0.55	0.55	1,218.62
Building Off Road Diesel	1.21	9.16	4.81	0.00	0.00	0.58	0.58	0.00	0.53	0.53	893.39
Building Vendor Trips	0.02	0.32	0.26	0.00	0.00	0.01	0.01	0.00	0.01	0.01	64.53
Building Worker Trips	0.10	0.17	2.96	0.00	0.01	0.01	0.02	0.00	0.01	0.01	260.70
Coating 10/15/2010-11/01/2010	71.38	0.05	0.96	0.00	0.00	0.00	0.01	0.00	0.00	0.00	84.86
Architectural Coating	71.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.03	0.05	0.96	0.00	0.00	0.00	0.01	0.00	0.00	0.00	84.86
Time Slice 10/18/2010-11/1/2010 Active Days: 11	71.38	0.05	0.96	0.00	0.00	0.00	0.01	0.00	0.00	0.00	84.86
Coating 10/15/2010-11/01/2010	71.38	0.05	0.96	0.00	0.00	0.00	0.01	0.00	0.00	0.00	84.86
Architectural Coating	71.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.03	0.05	0.96	0.00	0.00	0.00	0.01	0.00	0.00	0.00	84.86

Phase Assumptions

Phase: Fine Grading 6/1/2010 - 7/15/2010 - Default Fine Site Grading Description

Total Acres Disturbed: 1.84

Maximum Daily Acreage Disturbed: 0.46

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

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Phase: Trenching 7/15/2010 - 8/1/2010 - Type Your Description Here

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 8/1/2010 - 9/1/2010 - Default Paving Description

Acres to be Paved: 0.46

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 9/1/2010 - 10/15/2010 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 10/15/2010 - 11/1/2010 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.03	0.39	0.32	0.00	0.00	0.00	463.65
Hearth - No Summer Emissions							
Landscape	0.12	0.02	1.55	0.00	0.01	0.01	2.81
Consumer Products	0.00						
Architectural Coatings	0.23						
TOTALS (lbs/day, unmitigated)	0.38	0.41	1.87	0.00	0.01	0.01	466.46

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Free-standing discount store	9.21	12.15	120.78	0.11	9.87	2.11	11,447.47
TOTALS (lbs/day, unmitigated)	9.21	12.15	120.78	0.11	9.87	2.11	11,447.47

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Free-standing discount store		40.18	1000 sq ft	39.97	1,605.99	11,873.12
					1,605.99	11,873.12

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	53.8	0.9	98.7	0.4
Light Truck < 3750 lbs	12.8	1.6	95.3	3.1
Light Truck 3751-5750 lbs	19.8	0.5	99.5	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.4	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	62.5	37.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Free-standing discount store				2.0	1.0	97.0

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: Z:\I&R Docs\08-138 Antioch Wal-Mart Expansion\AQ\Antioch WM Expansion Urbemis.urb924

Project Name: Antioch Walmart Existing

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (tons/year unmitigated)	0.54	0.82	0.52	0.00	0.15	0.05	0.20	0.03	0.04	0.08	83.85

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.06	0.07	0.20	0.00	0.00	0.00	84.87

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	1.81	2.58	22.69	0.02	1.80	0.39	1,994.69

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	1.87	2.65	22.89	0.02	1.80	0.39	2,079.56

Construction Unmitigated Detail Report:

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CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010	0.54	0.82	0.52	0.00	0.15	0.05	0.20	0.03	0.04	0.08	83.85
Fine Grading 06/01/2010-07/15/2010	0.05	0.41	0.22	0.00	0.15	0.02	0.17	0.03	0.02	0.05	38.76
Fine Grading Dust	0.00	0.00	0.00	0.00	0.15	0.00	0.15	0.03	0.00	0.03	0.00
Fine Grading Off Road Diesel	0.05	0.41	0.21	0.00	0.00	0.02	0.02	0.00	0.02	0.02	37.08
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.68
Trenching 07/15/2010-08/01/2010	0.01	0.11	0.06	0.00	0.00	0.01	0.01	0.00	0.00	0.00	10.90
Trenching Off Road Diesel	0.01	0.11	0.05	0.00	0.00	0.01	0.01	0.00	0.00	0.00	10.29
Trenching Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61
Asphalt 08/01/2010-09/01/2010	0.02	0.14	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	13.58
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.02	0.14	0.08	0.00	0.00	0.01	0.01	0.00	0.01	0.01	11.26
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26
Paving Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.05
Building 09/01/2010-10/15/2010	0.02	0.16	0.13	0.00	0.00	0.01	0.01	0.00	0.01	0.01	20.11
Building Off Road Diesel	0.02	0.15	0.08	0.00	0.00	0.01	0.01	0.00	0.01	0.01	14.74
Building Vendor Trips	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06
Building Worker Trips	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.30
Coating 10/15/2010-11/01/2010	0.43	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51
Architectural Coating	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51

Phase Assumptions

Phase: Fine Grading 6/1/2010 - 7/15/2010 - Default Fine Site Grading Description

Total Acres Disturbed: 1.84

Maximum Daily Acreage Disturbed: 0.46

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 7/15/2010 - 8/1/2010 - Type Your Description Here

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 8/1/2010 - 9/1/2010 - Default Paving Description

Acres to be Paved: 0.46

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 9/1/2010 - 10/15/2010 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 10/15/2010 - 11/1/2010 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.01	0.07	0.06	0.00	0.00	0.00	84.62
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscape	0.01	0.00	0.14	0.00	0.00	0.00	0.25
Consumer Products	0.00						
Architectural Coatings	0.04						
TOTALS (tons/year, unmitigated)	0.06	0.07	0.20	0.00	0.00	0.00	84.87

Area Source Changes to Defaults

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Free-standing discount store	1.81	2.58	22.69	0.02	1.80	0.39	1,994.69
TOTALS (tons/year, unmitigated)	1.81	2.58	22.69	0.02	1.80	0.39	1,994.69

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Free-standing discount store		40.18	1000 sq ft	39.97	1,605.99	11,873.12
					1,605.99	11,873.12

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	53.8	0.9	98.7	0.4
Light Truck < 3750 lbs	12.8	1.6	95.3	3.1
Light Truck 3751-5750 lbs	19.8	0.5	99.5	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.4	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	62.5	37.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Free-standing discount store				2.0	1.0	97.0

Appendix 2 CO Calculations

Antioch Walmart

CARBON MONOXIDE ANALYSIS

PM Peak Hour
Assumes worst case of all intersections based on total volume, LOS and project traffic contribution

Traffic Volume

Intersection	Existing (2008)	Near Term (2015)	Near Term + Project (2015)	Cumulative (2025)	Cumulative + Project (2025)
Link: Int 6: Lone Tree Way & Mokelumne Drive					
Lone Tree Way (4-Lanes)	1881	2871	2870	3050	3049
Mokelumne Drive (2-Lanes)	556	588	588	876	1000
Link: Int. 8: Lone Tree Way & Deer Valley Road					
Lone Tree Way (4-Lanes)	1918	3171	3168	3305	3302
Deer Valley Road (4-Lanes)	1205	2509	2509	2526	2525
Link: Int. 14: Lone Tree Way & Hillcrest Avenue					
Lone Tree Way (4-Lanes)	2536	3369	3367	4124	4122
Hillcrest Avenue (4-Lanes)	1044	1400	1400	1900	1900
Link: Int 18: Lone Tree Way & SR-4 Bypass					
Lone Tree Way (4-Lanes	3224	4401	4399	5684	5683
SR-4 Bypass Ramps (4-Lanes)	787	1109	1109	1334	1334
SR-4 Bypass (4-Lanes)	6800	6800	6800	6800	6800

1-Hour CO Contribution

Intersection	Existing (2008)	Near Term (2015)	Near Term + Project (2015)	Cumulative (2025)	Cumulative + Project (2025)
Link: Int 6: Lone Tree Way & Mokelumne Drive					
Lone Tree Way (4-Lanes)	1.8	1.4	0.4	0.2	0.2
Mokelumne Drive (2-Lanes)	0.2	0.1	0.1	0.1	0.1
Link: Int. 8: Lone Tree Way & Deer Valley Road					
Lone Tree Way (4-Lanes)	1.9	1.5	1.5	0.8	0.8
Deer Valley Road (4-Lanes)	0.4	0.4	0.4	0.2	0.2
Link: Int. 14: Lone Tree Way & Hillcrest Avenue					
Lone Tree Way (4-Lanes)	3.1	2.0	2.0	1.2	1.2
Hillcrest Avenue (4-Lanes)	0.4	0.2	0.2	0.2	0.2
Link: Int 18: Lone Tree Way & SR-4 Bypass					
Lone Tree Way (4-Lanes	3.9	2.7	2.7	1.7	1.7
SR-4 Bypass Ramps (4-Lanes)	0.3	0.2	0.2	0.1	0.1
SR-4 Bypass (4-Lanes)	4.9	2.6	2.6	1.4	1.4

Total 1-Hour Concentration

Intersection	Existing (2008)	Near Term (2015)	Near Term + Project (2015)	Cumulative (2025)	Cumulative + Project (2025)
Link: Int 6: Lone Tree Way & Mokelumne Drive	**5.3**	**4.8**	**3.8**	**3.6**	**3.6**
Link: Int. 8: Lone Tree Way & Deer Valley Road	**5.6**	**5.2**	**5.2**	**4.3**	**4.3**
Link: Int. 14: Lone Tree Way & Hillcrest Avenue	**6.7**	**5.6**	**5.6**	**4.7**	**4.7**
Link: Int 18: Lone Tree Way & SR-4 Bypass	**12.4**	**8.8**	**8.8**	**6.5**	**6.5**

Total 8-Hour Concentration

Intersection	Existing (2008)	Near Term (2015)	Near Term + Project (2015)	Cumulative (2025)	Cumulative + Project (2025)
Link: Int 6: Lone Tree Way & Mokelumne Drive	**3.3**	**2.9**	**2.3**	**2.1**	**2.1**
Link: Int. 8: Lone Tree Way & Deer Valley Road	**3.5**	**3.3**	**3.3**	**2.6**	**2.6**
Link: Int. 14: Lone Tree Way & Hillcrest Avenue	**4.3**	**3.5**	**3.5**	**2.9**	**2.9**
Link: Int 18: Lone Tree Way & SR-4 Bypass	**8.2**	**5.7**	**5.7**	**4.1**	**4.1**

Emission Factors (EMFAC2007 - 5mph)
Contra Costa County

LOS E or F (5mph)	Year	Speed	Factor
	2008	(5 mph)	10.230 g/mi
	2015	(5mph)	5.070 g/mi
	2025	(5mph)	2.500 g/mi

Background CO Levels -

	1-Hour	8-Hour
Pittsburg Monitoring Station	3.3	1.9

Emission Factors (EMFAC2007 - 5mph)
Contra Costa County

Freeway	Year	Speed	Factor
	2008	(25 mph)	6.020 g/mi
	2015	(25mph)	3.270 g/mi
	2025	(25mph)	1.730 g/mi

Dispersion Factors

	Lanes	Edge
Primary	2 Ln	14.0
	4 Ln	11.9
	6 Ln	9.5
Secondary	2 Ln	3.7
	4 Ln	3.3
	6 Ln	2.8

Appendix 3 DPM Health Risk Assessment

Table A3-1
Proposed Antioch Wal-Mart Expansion Project - On Site Emissions & Model Parameters
Diesel PM Emissions From Vehicles During Project Operation

Vehicle/Trip Info and DPM Emission Rates			
Customer Vehicles			
Vehicle Type	**LDA & LDT**	**MDT**	**Total**
% Trips	98%	2%	100%
No. Trips (two-way trips/day)	8,723	178	8,901
% Diesel Vehicles	0.82%	5.62%	6.44%
Project Diesel Trips (trips/day)	71.7	10.0	81.7
DPM Emis Factors (g/mi)			
at 15 mph	0.129	0.073	
at 35 mph	0.066	0.038	
Truck Deliveries			
Vehicle Type	**LHD1**	**HHD**	**Total**
No. Trips (one-way trips/day)	24	20	44
% Diesel Vehicles	100%	100%	100%
Project Diesel Trips (trips/day)	24	20	44
DPM Emis Factors (g/mi)			
at 15 mph	0.065	1.063	
at 35 mph	0.034	0.474	
On-Site Vehicle Emissions*	**Customer Vehicles***	**Delivery** Trucks**	**Total**
Trip Length (mi)	0.25	-	
DPM Emissions (lb/day)	0.006	0.009	0.014
DPM Emissions (lb/year)	2.01	3.26	5.27
LDA = light duty auto, LDT = light duty truck, MDT = medium duty truck			
LHD1 = light heavy-duty truck, HHD = heavy heavy-duty truck			
* On-site travel speed of 15 mph			
** Delivery truck emissions from Onsite Truck Emissions spreadsheet			

Table A3-2
Proposed Antioch Wal-Mart Expansion Project
Summary of DPM Emission Rates Used For On Site Vehicle Modeling

Activity	Annual DPM Emissions (pounds/year)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area Name	Area Size (m^2)	Area Source Rate ($g/s/m^2$)
Construction	100.0	0.011416	1.44E-03	CONSTR	17,882	8.044E-08
Customer On-Site Travel*	2.23E-01	4.36E-05	5.49E-06	PAREA1	3,194	1.72E-09
	9.90E-02	1.94E-05	2.44E-06	PAREA2	1,420	1.72E-09
	4.26E-01	8.34E-05	1.05E-05	PAREA3	6,112	1.72E-09
	6.70E-01	1.31E-04	1.65E-05	PAREA4	9,610	1.72E-09
	5.91E-01	1.16E-04	1.46E-05	PARKNEW	8,475	1.72E-09
Total	2.01	3.93E-04	4.95E-05	-	28,810	-

Notes: * Hourly operation emissions assumed to occur 14 hours/day (8 am to 10 pm) for 365 days/year.
PAREA1 - PAREA4 & PARKNEW are area sources representing parking/travel areas.

Table A3-3
Existing Antioch Wal-Mart Store - On Site Emissions & Model Parameters
Diesel PM Emissions From Vehicles During Project Operation

Vehicle/Trip Info and DPM Emission Rates			
Customer Vehicles			
Vehicle Type	**LDA & LDT**	**MDT**	**Total**
% Trips	98%	2%	100%
No. Trips (two-way trips/day)	7,149	146	7,295
% Diesel Vehicles	0.82%	5.62%	6.44%
Project Diesel Trips (trips/day)	58.7	8.2	66.9
DPM Emis Factors (g/mi)			
at 15 mph	0.129	0.073	
at 35 mph	0.066	0.038	
Truck Deliveries			
Vehicle Type	**LHD1**	**HHD**	**Total**
No. Trips (one-way trips/day)	16	16	32
% Diesel Vehicles	100%	100%	100%
Project Diesel Trips (trips/day)	16	16	32
DPM Emis Factors (g/mi)			
at 15 mph	0.065	1.063	
at 35 mph	0.034	0.474	
On-Site Vehicle Emissions*	**Customer Vehicles***	**Delivery** Trucks**	**Total**
Trip Length (mi)	0.2	-	
DPM Emissions (lb/day)	0.004	0.007	0.011
DPM Emissions (lb/year)	1.32	2.58	3.90
LDA = light duty auto, LDT = light duty truck, MDT = medium duty truck			
LHD1 = light heavy-duty truck, HHD = heavy heavy-duty truck			
* On-site travel speed of 15 mph			
** Delivery truck emissions from Onsite Truck Emissions spreadsheet			

Table A3-4
Existing Antioch Wal-Mart Store
Summary of DPM Emission Rates Used For On Site Vehicle Modeling

Activity	Annual DPM Emissions (pounds/year)	DPM Emissions (lb/hr)	DPM Emissions (g/s)	Modeled Area Name	Area Size (m^2)	Area Source Rate ($g/s/m^2$)
Customer On-Site Travel*	2.07E-01	4.05E-05	5.10E-06	PAREA1	3,194	1.60E-09
	9.20E-02	1.80E-05	2.27E-06	PAREA2	1,420	1.60E-09
	3.96E-01	7.75E-05	9.76E-06	PAREA3	6,112	1.60E-09
	6.22E-01	1.22E-04	1.53E-05	PAREA4	9,610	1.60E-09
Total	1.32	2.58E-04	3.25E-05	-	20,335	-

Notes: * Hourly operation emissions assumed to occur 14 hours/day (8 am to 10 pm) for 365 days/year.
PAREA1 - PAREA4 are area sources representing parking/travel areas.

Table A3-5
Proposed Antioch Wal-Mart Expansion Project - On-Site Truck Emissions

On-Site Truck Delivery Emissions

Segment ID	Road Length (m)	Trip Period		4-Axle Truck Trips One-Way	2-Axle Truck Trips One-Way	PM10 Exhaust Emissions				
		Time	(hours)			4-Axle Emissions (g/day)	2-Axle Emissions (g/day)	Total Daily (lb/day)	Hourly (lb/hr)	Annual (lb/year)
TRUCK_IN	357	7am - 10pm	15	10	12	2.36	0.17	5.58E-03	3.72E-04	2.04
TRUCKOUT	214.5	7am - 10pm	15	10	12	1.42	0.10	3.35E-03	2.24E-04	1.22
Total				**20**	**24**	**3.77**	**0.28**	**8.93E-03**	**5.96E-04**	**3.26**

Emission Factors (2010) at 15 mph
4-Axle HHD (g/mi) = 1.063
2-Axle LHD1 (g/mi) = 0.065

Table A3-5
Existing Antioch Wal-Mart Store - On-Site Truck Emissions

On-Site Truck Delivery Emissions

Segment ID	Road Length (m)	Trip Period Time	Trip Period (hours)	4-Axle Truck Trips One-Way	2-Axle Truck Trips One-Way	PM10 Exhaust Emissions 4-Axle Emissions (g/day)	PM10 Exhaust Emissions 2-Axle Emissions (g/day)	PM10 Exhaust Emissions Total Daily (lb/day)	PM10 Exhaust Emissions Hourly (lb/hr)	PM10 Exhaust Emissions Annual (lb/year)
TRKINOUT	98.7	7am - 10pm	15	16	16	1.04	0.06	2.44E-03	1.63E-04	0.89
Total				**16**	**16**	**1.04**	**0.06**	**2.44E-03**	**1.63E-04**	**0.89**

Emission Factors (2010) at 15 mph
4-Axle HHD (g/mi) = 1.063
2-Axle LHD1 (g/mi) = 0.065

Table A3-6
Proposed Antioch Wal-Mart Expansion Project
Off Site Truck and Vehicle DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emission Factors
Year = 2010

Link No.	Description	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Volume Source Height (m)	Release Height (m)	Daily Total Vehicle Trips	Daily Diesel Vehicle Trips	Trip Period	Average Speed (mph)	Emission Factor (g/mi)	Link Emission Rate (g/s)
Customer/Employee Vehicle Travel													
1	Hillcrest Ave - North	4	965.0	68	20.7	2.0	1.0	2,314	21	8am - 10pm	35	0.0659	1.66E-05
2	Hillcrest Ave - South	4	600.6	68	20.7	2.0	1.0	445	4	8am - 10pm	35	0.0659	1.99E-06
3	Lone Tree Way - East	6	813.4	92	28.0	2.0	1.0	2,848	26	8am - 10pm	35	0.0659	1.73E-05
4	Lone Tree Way - West	5	1143.4	80	24.4	2.0	1.0	3,293	30	8am - 10pm	35	0.0659	2.81E-05
Delivery Truck Travel													
TLINE1	Hillcrest Ave - North	1	241.1	32	9.8	3.7	1.8	22	22	7am - 10pm	35	0.1650	1.01E-05
TLINE2	Lone Tree Way - East	6	813.4	92	28.0	3.7	1.8	44	44	7am - 10pm	35	0.1650	6.79E-05
TLINE3	Lone Tree Way - West	1	303.6	32	9.8	3.7	1.8	22	22	7am - 10pm	35	0.1650	1.27E-05

Speed (mph)	2010 DPM Emission Factors (g/mi) LDA & LDT	MDT	LHD1	HDT
35	0.0664	0.0380	0.0340	0.3221
55	0.0490	0.0278	0.0250	0.3118
% Diesel	0.82%	5.62%	30%	80%
Source:	EMFAC2007 Model, Contra Costa Co.			
Customer Vehicles	98%	2%	-	-
Delivery Trucks	-	-	55%	45%

Table A3-7
Existing Antioch Wal-Mart Store
Off Site Truck and Vehicle DPM Modeling - Roadway Links, Traffic Volumes, and DPM Emission Factors
Year = 2010

Link No.	Description	No. Lanes	Link Length (m)	Link Width (ft)	Link Width (m)	Volume Source Height (m)	Release Height (m)	Daily Total Vehicle Trips	Daily Diesel Vehicle Trips	Trip Period	Average Speed (mph)	Emission Factor (g/mi)	Link Emission Rate (g/s)
Customer/Employee Vehicle Travel													
1	Hillcrest Ave - North	4	965.0	68	20.7	2.0	1.0	1,897	17	8am - 10pm	35	0.0659	1.36E-05
2	Hillcrest Ave - South	4	600.6	68	20.7	2.0	1.0	365	3	8am - 10pm	35	0.0659	1.63E-06
3	Lone Tree Way - East	6	813.4	92	28.0	2.0	1.0	2,334	21	8am - 10pm	35	0.0659	1.41E-05
4	Lone Tree Way - West	5	1143.4	80	24.4	2.0	1.0	2,699	25	8am - 10pm	35	0.0659	2.30E-05
Delivery Truck Travel													
TLINE1	Hillcrest Ave - North	2	241.1	44	13.4	3.7	1.8	32	32	7am - 10pm	35	0.1781	1.58E-05
TLINE2	Lone Tree Way - East	6	813.4	92	28.0	3.7	1.8	32	32	7am - 10pm	35	0.1781	5.33E-05

Speed (mph)	2010 DPM Emission Factors (g/mi) LDA & LDT	MDT	LHD1	HDT
35	0.0664	0.0380	0.0340	0.3221
55	0.0490	0.0278	0.0250	0.3118
% Diesel	0.82%	5.62%	30%	80%
Source:	EMFAC2007 Model, Contra Co.			
Customer Vehicles	98%	2%	-	-
Delivery Trucks	-	-	50%	50%

Table A3-8
Proposed Antioch Wal-Mart Expansion Project
Truck Deliveries and PM10 Emissions for Truck Idling & TRUs

Source Type	Daily Truck Deliveries 4+ Axle w/TRU*	4+ Axle w/o TRU	2 Axle	Total 4-Axle	Total 2-Axle	Oper. Time per Event (hour)	Daily PM10 (g/day)	Annual PM10 Emissions (lb/year)
Truck Idle	2	8	12	10	12	0.083	2.332	1.88
TRU	2	-	-	-	-	0.5	0.360	0.29
Totals	-	-	-	**10**	**12**	-	**2.7**	**2.17**

* TRU = Transport Refrigeration Unit

Operation Days = 365
TRU Emission Rate[a] (g/hr) = 0.36
LHD1 Truck Idle Emissions[b] (g/hr) = 0.777
HHD Truck Idle Emissions[b] (g/hr) = 1.866
TRU engine (hp) = 34
TRU PM emission factor (g/hp-hr) = 0.02
TRU engine load factor (%) = 53
TRU run time (min) = 30
Truck idle time (min) = 5

Notes:
a TRU emission factor of 0.02 g/hp-hr (TRU emission standard, title 13 CCR, section 2477) and 34 hp engine with 53% load factor
TRUs assumed to run 30 min per truck per day
b Idle emissions for trucks based on EMFAC 2007 for 2010 Contra Costa Co. with default vehicle mix and truck speed of 0 mph
4-axle trucks assumed to be heavy duty diesel (HHD) and 2-axle trucks assumed to be light heavy duty diesel (LHD1) trucks.
Trucks assumed to idle for a maximum of 5 min per truck per day

Table A3-9
Existing Antioch Wal-Mart
Truck Deliveries and PM10 Emissions for Truck Idling & TRUs

	Daily Truck Deliveries							Annual
Source Type	4+ Axle w/TRU*	4+ Axle w/o TRU	2 Axle	Total 4-Axle	Total 2-Axle	Oper. Time per Event (hour)	Daily PM10 (g/day)	PM10 Emissions (lb/year)
Truck Idle	0	8	8	8	8	0.083	1.762	1.42
TRU	0	-	-	-	-	0.5	0.000	0.00
Totals	**-**	**-**	**-**	**8**	**8**	**-**	**1.8**	**1.42**

* TRU = Transport Refrigeration Unit

Operation Days = 365

TRU Emission Rate[a] (g/hr) =	0.36
LHD1 Truck Idle Emissions[b] (g/hr) =	0.777
HHD Truck Idle Emissions[b] (g/hr) =	1.866
TRU engine (hp) =	34
TRU PM emission factor (g/hp-hr) =	0.02
TRU engine load factor (%) =	53
TRU run time (min) =	30
Truck idle time (min) =	5

Notes:

a TRU emission factor of 0.02 g/hp-hr (TRU emission standard, title 13 CCR, section 2477) and 34 hp engine with 53% load factor TRUs assumed to run 30 min per truck per day

b Idle emissions for trucks based on EMFAC 2007 for 2010 Contra Costa Co. with default vehicle mix and truck speed of 0 mph 4-axle trucks assumed to be heavy duty diesel (HHD) and 2-axle trucks assumed to be light heavy duty diesel (LHD1) trucks. Trucks assumed to idle for a maximum of 5 min per truck per day

Table A3-10 Antioch Wall-Mart Expansion Project
Increased Cancer Risks Fom Project-Related DPM Emissions

Net Increase of Cancer Risks (per million) From Proposed Wal-Mart Expansion

Scenario	Off-Site Worker	Residential
Proposed Expansion	2.85	2.25
Existing Store	0.96	2.18
Net Increased Cancer Risk	**1.89**	**0.07**

Proposed Wal-Mart Expansion - Cumulative DPM Impacts and Cancer Risks

Project	Annual DPM Emissions	Maximum DPM Concentrations and Associated Cancer Risk (per million)					
		Maximum Off-Site Worker Exposure			*Maximum Residential Exposure*		
		Max Concentration (ug/m³)		Cancer Risk[c]	Max Concentration (ug/m³)		Cancer Risk[d]
Project Activity/Emission Source	(pounds/yr)	1-Hour	Annual Avg.	(per million)	1-Hour	Annual Avg.	(per million)
Construction[a]	100.0	1.0270	0.103	0.16	0.4160	0.042	0.04
Operation[b]							
On-Site Delivery Trucks	3.26	0.0532	0.005	1.69	0.0376	0.004	1.20
On-Site Delivery Truck Idling & TRUs	2.17	0.0234	0.002	0.75	0.0187	0.002	0.60
Off-site Delivery Truck Travel	3.94	0.0003	0.000	0.01	0.0058	0.001	0.18
On-Site Customer Travel/Parking	2.01	0.0069	0.001	0.22	0.0067	0.001	0.21
Off-Site Customer Travel	2.59	0.0005	0.000	0.02	0.0006	0.000	0.02
Subtotal	14.0	0.0843	0.008	2.69	0.0694	0.0069	2.21
Total	**114.0**			**2.85**			**2.25**

a Cancer risk based on 1 year of exposure to construction emissions over a 70-year exposure period
b Cancer risk from operation activities based on 70-year exposure
c Residential DPM Unit Risk Factor (risk per million per ug/m³) = 318.5
d Off-Site Worker DPM Unit Risk Factor (risk per million per ug/m³) = 62.9

Existing Wal-Mart Store - DPM Impacts and Cancer Risks

Project	Annual DPM Emissions	Maximum DPM Concentrations and Associated Cancer Risk (per million)					
		Maximum Off-Site Worker Exposure			*Maximum Residential Exposure*		
		Max Concentration (ug/m³)		Cancer Risk[b]	Max Concentration (ug/m³)		Cancer Risk[c]
Project Activity/Emission Source	(pounds/yr)	1-Hour	Annual Avg.	(per million)	1-Hour	Annual Avg.	(per million)
Operation[a]							
On-Site Delivery Trucks	0.89	0.0000	0.000	0.00	0.0429	0.004	1.37
On-Site Delivery Truck Idling & TRUs	1.42	0.0000	0.000	0.00	0.0136	0.001	0.43
Off-site Delivery Truck Travel	3.00	0.0064	0.001	0.20	0.0084	0.001	0.27
On-Site Customer Travel/Parking	1.3	0.0215	0.002	0.68	0.0032	0.000	0.10
Off-Site Customer Travel	2.13	0.0023	0.000	0.07	0.0003	0.000	0.01
Subtotal	8.76	0.0302	0.0030	0.96	0.0684	0.0	2.18
Total	**8.8**			**0.96**			**2.18**

a Cancer risk from operation activities based on 70-year exposure
b Residential DPM Unit Risk Factor (risk per million per ug/m³) = 318.5
c Off-Site Worker DPM Unit Risk Factor (risk per million per ug/m³) = 62.9

Cancer Risk Calculation Method

Inhalation Dose = C_{air} x DBR x A x EF x ED x 10^{-6} / AT

Where: C_{air} = concentration in air ($\mu g/m^3$)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
AT = Averaging time period over which exposure is averaged.
10^{-6} = Conversion factor

Inhalation Dose Factors

Exposure Type	Value[1]					
	DBR (L/kg BW -day)	A (-)	Exposure (hr/day)	EF (days/yr)	ED (Years)	AT (days)
Residential (70-Yr Exposure)	302	1	24	350	70	25,550
Residential (30-Yr Exposure)	302	1	24	350	30	25,550
Off-Site Worker	149	1	8	245	40	25,550

1 Default values recommended by OEHHA& Bay Area Air Quality Management District

Cancer Risk (per million) = CPF x Inhalation Dose x 1.0E6
= URF x Cair

Where: CPF = Cancer potency factor $(mg/kg\text{-}day)^{-1}$
URF =Unit risk factor (cancer risk per $\mu g/m^3$)

Diesel Particulate Matter Unit Risk Factors

Exposure Type	CPF $(mg/kg\text{-}day)^{-1}$	URF *(Risk/million/μg/m³)*
Residential (70-Yr Exposure)	1.10E+00	318.5
Residential (30-Yr Exposure)	1.10E+00	136.5
Off-Site Worker	1.10E+00	62.9

Figure 1
Project Area and Modeling Receptors

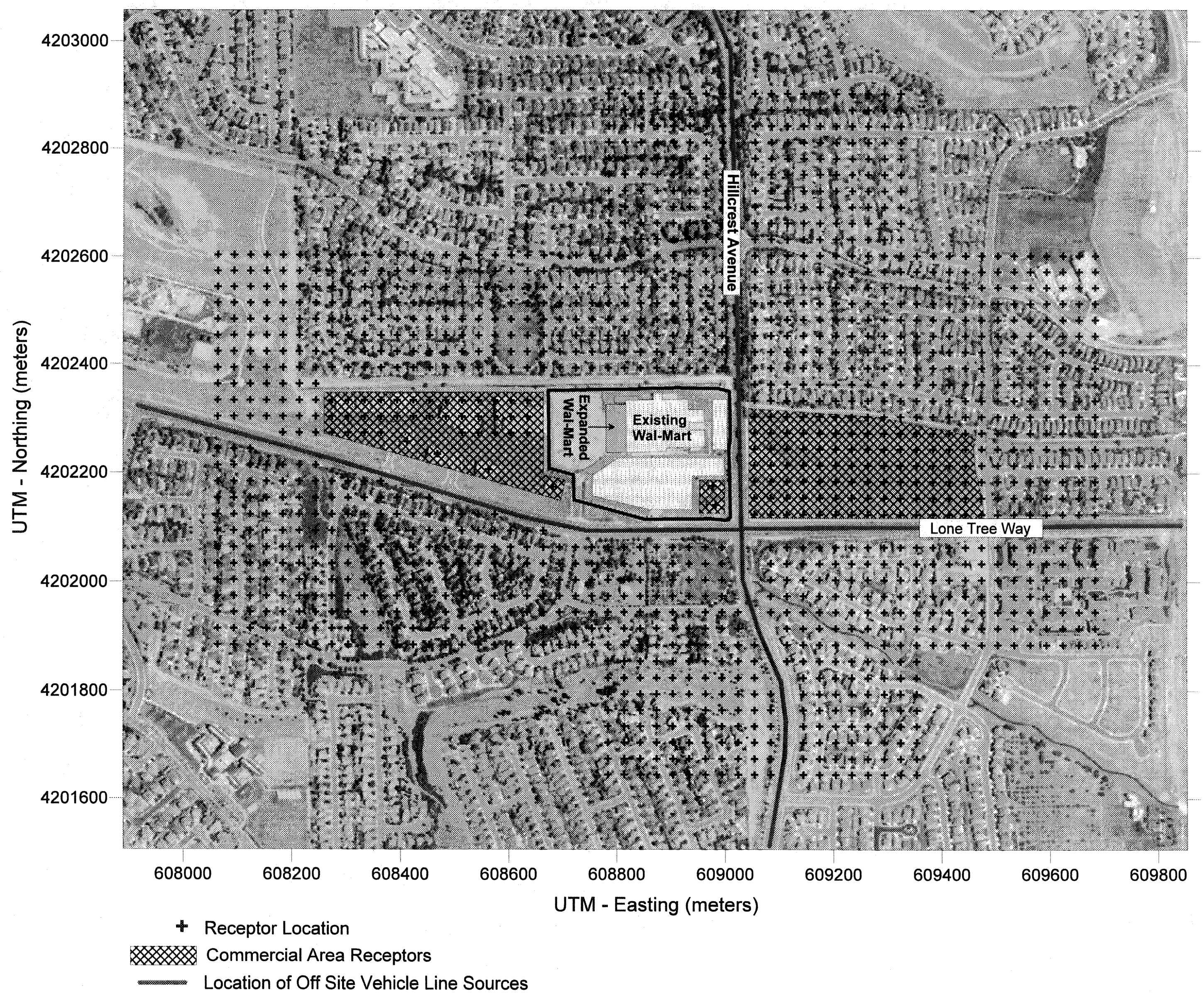

Figure 2
Proposed Antioch Wal-Mart Expansion
Emission Source Locations