Workshop Draft Options Report

California Environmental Quality Act Thresholds of Significance

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

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April 2009

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BAY AREA AIR QUALITY MANAGEMENT DISTRICT

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ACRONYMS AND ABBREVIATIONS

$\mu g/m^3$	micrograms per cubic meter
AB	Assembly Bill
ABAG	Association of Bay Area Governments
APS	Alternative Planning Strategy
AQP	air quality plan
ARB	California Air Resources Board
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
BMP	Best Management Practices
CAA	federal Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAP	climate action plan
CAPCOA	California Air Pollution Control Officers Association
CARE	Community Air Risk Evaluation
CCAA	California Clean Air Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
DOF	California Department of Finance
EDD	California Economic Development Department
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
ERPG	Emergency Response Planning Guidelines
GBC	California Green Building Code
GHG	greenhouse gas
GPA	general plan amendment
HAP	hazardous air pollutants
IS/MND	Initial Study/Mitigated Negative Declaration
lb/day	pounds per day
LCFS	Low Carbon Fuel Standard
LOS	level of service
MDAQMD	Mojave Desert Air Quality Management District
MEI	Maximally Exposed Individual

MMT	million metric tons
MMT/yr	million metric tons per year
MPO	Metropolitan Planning Organization
MT	metric tons
N_2O	nitrous oxide
NAAQS	National Ambient Air Qualtiy Standards
NAICS	North American Industry Classification System
NOE	Notice of Exemption
NO_X	oxides of nitrogen
NSR	New Source Review
OPR	Governor's Office of Planning and Research
PM_{10}	respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less
$PM_{2.5}$	fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less
PM	particulate matter
ppm	parts per million
PSD	Prevention of Significant Deterioration
RMPP	Risk Management Prevention Program
ROG	reactive organic gases
RTP	Regional Transportation Plan
SB	Senate Bill
SCH	California State Clearinghouse
SCS	Sustainable Communities Strategy
sf	square feet
SFBAAB	San Francisco Bay Area Air Basin
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO_2	sulfur dioxide
TACs	toxic air contaminants
T-BACT	Toxic Best Available Control Technology
TBPs	Toxic Best Practices
TCMs	transportation control measures
tons/day	tons per day
tpy	tons per year
UNFCCC	United Nations Framework Convention on Climate Change
URBEMIS	Urban Emissions Model
VCAPCD	Ventura County Air Pollution Control District
VMT	vehicle miles traveled

1 INTRODUCTION

The Bay Area Air Quality Management District (BAAQMD) has direct and indirect regulatory authority over sources of air pollution in the San Francisco Bay Area Air Basin (SFBAAB), which is currently designated as an ozone nonattainment area for the California and national ambient air quality standards (CAAQS and NAAQS, respectively). The U.S. Environmental Protection Agency (EPA) has also recently designated the SFBAAB as nonattainment for the new 24-hour fine particulate with an aerodynamic resistance diameter of 2.5 micrometers or less ($PM_{2.5}$) standard of 35 microgram per cubic meter ($\mu g/m^3$). However, since the new presidential administration has ordered a freeze on all pending federal rules, the designation will not be effective until after publication of the regulation in the Federal Register. With regards to the CAAQS, the SFBAAB is also designated as a nonattainment area for respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less (PM_{10}) and $PM_{2.5}$. As a result of past, present, and future development projects within BAAQMD's jurisdiction, and the current nonattainment status of the SFBAAB, a cumulative air quality impact exists. The most current attainment designations for the SFBAAB are shown in Table 1 for each CAAQS and NAAQS as applicable.

The purpose of this report is to evaluate options for California Environmental Quality Act (CEQA) thresholds of significance for use within BAAQMD's jurisdiction. As part of an earlier task, EDAW's first step in this process was to research current CEQA thresholds of significant used by other air districts in California and supporting documentation, where available, as compiled in Appendix A and summarized below.

With respect to criteria air pollutant and precursor emissions, numerous air districts (e.g., Monterey Bay Unified Air Pollution Control District, Santa Barbara County Air Pollution Control District, Mojave Desert Air Quality Management District [MDAQMD], and South Coast Air Quality Management District) have based thresholds of significance for reactive organic gases (ROG) and oxides of nitrogen (NO_X) on limits established by the federal New Source Review (NSR) Program. In certain cases, these NSR limits, which are identified in regulation on an annual basis (tons per year [tpy]), are converted to pounds per day (lb/day) for precursor emissions. While some air districts have no quantitative threshold levels, many use the CAAQS as thresholds of significance, particularly for carbon monoxide (CO) where impacts are more localized in nature. Dispersion modeling is often required to evaluate whether a concentration-based threshold would be exceeded as a result of project implementation. Within jurisdictions where thresholds of significance have not been adopted, air districts advise the lead agencies on a case-by-case basis and rely on guidance of nearby air districts.

EDAW obtained supporting documentation for non-NSR-derived thresholds of significance from the Sacramento Metropolitan Air Quality Management District (SMAQMD) and the Ventura County Air Pollution Control District (VCAPCD). SMAQMD prepared draft justification documentation for both construction- and operational-related thresholds of significance in 2001. The bases for these were derived from the reductions (tons per day [tons/day] of ozone precursors) committed to by control measures contained in the State Implementation Plan and in a manner that was intended to optimize capture (i.e., require mitigation) of a substantial portion of projects, while requiring a level of mitigation that would be realistic and achievable.

VCAPCD developed thresholds of significance for precursors by determining the emissions capture rate associated with applying five different increments of ROG and NO_X emissions levels to projected development. This approach was intended to achieve a balance between the number of projects affected and the amount of emissions subject to mitigation.

Table 1
Ambient Air Quality Standards and Designations for the San Francisco Bay Area Air Basin

Pollutant	Averaging Time	California		National [1]		
		Standards [2,3]	Attainment Status [4]	Primary [3, 5]	Secondary [3, 6]	Attainment Status [7]
Ozone	1-hour	0.09 ppm (180 µg/m^3)	N (Serious)	–	–	–
	8-hour	0.07 ppm (137 µg/m^3)	–	0.75 ppm (147 µg/m^3)	Same as Primary Standard	N
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	A	35 ppm (40 mg/m^3)	–	U/A
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (56 µg/m^3)	–	0.053 ppm (100 µg/m^3)	Same as Primary Standard	U/A
	1-hour	0.18 ppm (338 µg/m^3)	A	–		–
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	–	0.030 ppm (80 µg/m^3)	–	A
	24-hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (365 µg/m^3)	–	
	3-hour	–	–	–	0.5 ppm (1300 µg/m^3)	
	1-hour	0.25 ppm (655 µg/m^3)	A	–	–	–
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N	-	Same as Primary Standard	U
	24-hour	50 µg/m^3		150 µg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	N	15 µg/m^3	Same as Primary Standard	N[9]
	24-hour	–	–	35 µg/m^3		
Lead[8]	30-day Average	1.5 µg/m^3	A	–	–	–
	Calendar Quarter	–	–	1.5 µg/m^3	Same as Primary Standard	

Table 1
Ambient Air Quality Standards and Designations for the San Francisco Bay Area Air Basin

Pollutant	Averaging Time	California		National [1]		
		Standards [2,3]	Attainment Status [4]	Primary [3, 5]	Secondary [3, 6]	Attainment Status [7]
Sulfates	24-hour	25 µg/m^3	A	**No National Standards**		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	U			
Vinyl Chloride[8]	24-hour	0.01 ppm (26 µg/m^3)	U			
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer—visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.	U			

Notes: µg/m^3 = micrograms per cubic meter; mg/m^3 = milligram per cubic meter; ppm = parts per million.

[1] National standards (other than ozone, respirable and fine particulate matter (PM_{10} and $PM_{2.5}$, respectively)), and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For respirable particulate matter, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 micrograms per cubic meter is equal to or less than one. For fine particulate matter, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

[2] California standards for ozone, carbon dioxide (except Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

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

[4] Unclassified (U): A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): A pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a 3-year period.
Nonattainment (N): A pollutant is designated nonattainment if there was a least one violation of a state standard for that pollutant in the area.
Nonattainment/Transitional (NT): A subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

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

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

[7] Nonattainment (N): Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
Attainment (A): Any area that meets the national primary or secondary ambient air quality standard for the pollutant.
Unclassifiable (U): Any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

[8] The California Air Resources Board has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[9] The U.S Environmental Protection Agency (EPA) lowered the 24-hour $PM_{2.5}$ standard from 65 µg/m^3 to 35 µg/m^3 in 2006. EPA issued attainment status designations for the 35 µg/m^3 standard on December 22, 2008. EPA has designated the San Francisco Bay Area Air Basin as nonattainment for the 35 µg/m^3 $PM_{2.5}$ standard. The EPA designation will be effective 90 days after publication of the regulation in the Federal Register. The Office of the President has ordered a freeze on all pending federal rules; therefore, the effective date of the designation is unknown at this time.

Source: ARB 2009c.

With respect to toxic air contaminants (TACs), an excess cancer risk level of 10 in one million and a hazard index of one are widely used based on a thorough review of district-adopted CEQA guidance and discussions with air district staff. In most cases, these are applied to stationary sources and not to construction or mobile sources of TACs. The rationale for not applying these to construction-related emissions is that such activities are short-term and intermittent in nature and the primary health concern with diesel particulate matter (PM) is long-term exposure. Because these were originally developed based on the behavior of stationary sources (e.g., constant emissions rate over time), these are also typically not applied to mobile sources. Some air districts (e.g., MDAQMD) also use adopted rules and regulations based on limits established by the federal Toxic NSR Program (e.g., new or modified source that emit more than 10 tpy of a single hazardous air pollutant [HAP] or more than 25 tpy of multiple HAPs would be required to implement maximum achievable control technology) for thresholds of significance (e.g., projects that would violate a rule or regulation would be considered significant with respect to TACs). Others refer to the *Air Quality and Land Use Handbook: A Community Health Perspective* released by the California Air Resources Board (ARB) in 2005 for guidance on land use compatibility issues; however, this document was intended to be advisory, not regulatory.

For assessing odor impacts, no quantitative thresholds of significance have been adopted, but instead many air districts use screening-level buffer distances for common odor-generating sources in combination with complaint history. Typically, a significant odor impact would occur under the complaint-based threshold if the project has: 1) more than one confirmed complaint per year averaged over a three-year period, or 2) more than three unconfirmed complaints per year averaged over a three-year period. Projects that would involve the siting of sensitive receptors within the screening-level distances or the siting of an odor-producing land use within these distances from existing sensitive receptors would be considered to have a significant odor impact and further analysis and/or mitigation would be required. Prevailing wind direction relative to the source and receptors are also taken into consideration.

Many air districts state that if implementation of a proposed project would not result in the generation of emissions that exceed applicable project-level mass emission thresholds, then the cumulative impact of the project on air quality would also be considered less than significant. In other words, if project-generated emissions would exceed the operational-related thresholds of significance in a designated nonattainment area, then the project's incremental contribution would be considered cumulatively considerable, and therefore, significant.

No air district in California has adopted a threshold of significance for greenhouse gas (GHG) emissions for nonindustrial land use development projects. On December 5, 2008 the South Coast Air Quality Management District adopted a GHG screening significance threshold for industrial projects of 10,000 metric tons CO_2e per year that also incorporates tiered decision tree approach to apply performance standards. In addition, pursuant to SB 97, OPR was directed to develop CEQA mitigation guidelines for GHG emissions. OPR looked to ARB for technical expertise in the development, and evidence in support, of these thresholds. ARB released its draft interim CEQA thresholds concepts for industrial, commercial, and residential projects for public comment in October 2008. As of the time of writing, ARB is still accepting public comments on these draft options, and has not suggested a timeline for revision or adoption.

2 THRESHOLD OPTIONS EVALUATION

The following section evaluates options for CEQA thresholds of significance for use within BAAQMD's jurisdiction including current approaches for impact determinations.

2.2 CONSTRUCTION-RELATED IMPACTS

2.2.1 CRITERIA AIR POLLUTANTS AND PRECURSORS

2.2.1.1 CURRENT APPROACH

BAAQMD's current threshold of significance for construction activities is qualitative in nature (i.e., emissions quantification is not required) and only applies to fugitive PM_{10} dust emissions. If BAAQMD-recommended Best Management Practices (BMPs), which are tiered based on the size of the construction site (less than or greater than four acres), are incorporated into the proposed project, then air quality impacts from project construction can be considered less than significant. The construction threshold of significance requires all projects, regardless of size, to implement at least a minimum level of mitigation for construction-related fugitive PM_{10} dust emissions.

2.2.1.2 OPTION 1: CLEAN AIR ACT EMISSIONS LIMIT APPROACH

The federal and California Clean Air Acts (CAA and CCAA, respectively) impose emission limitations on stationary sources (e.g., federal NSR, and BAAQMD Best Available Control Technology [BACT] and Offset Requirements) that serve to reduce emissions from those sources to the extent feasible. This approach evaluates the use of the CAA/CCAA stationary source emission limitation levels as CEQA thresholds of significance for construction-related criteria air pollutant and precursor emissions. This approach is considered appropriate because the source of the emissions is irrelevant to their effect on cumulative air quality impacts.

Basis and Analysis

The NSR Program[1] was created by the CAA to ensure that stationary sources of air pollution are constructed or modified in a manner that is consistent with attainment of health-based ambient air quality standards. Existing regulations require the NSR Program to address any pollutant for which there is an established ambient air quality standard. The NSR Program is composed of two primary components: Prevention of Significant Deterioration (PSD) applies to pollutants where the standard has been attained and NSR applies to pollutants where the standard has not been attained. The CAA regulations also require the installation of BACT, air quality monitoring and modeling analyses to ensure that a project's emissions will not cause or contribute to a violation of any air quality standard, limiting the incremental increase of a pollutant and offsetting new emissions with creditable emission reductions.

The determination of whether a source is subject to NSR is based, in part, on comparison to the Significant Emission Rates identified in the regulations. These are derived from modeling analyses to determine the level of emissions below which a source alone is not expected to have an impact on air quality (Please refer to Table 2). Though the limits are adopted in regulation to control stationary source emissions, they are considered to have the same effect of controlling emissions from land use development.

BAAQMD Regulation 2, Rule 2 provides for the review of new and modified sources and mechanisms, including the use of BACT and offsets before a source is allowed to operate. Specifically, an applicant for a permit to

[1] Code of Federal Regulation (CFR) [i.e., PSD (40 CFR 52.21, 40 CFR 51.166, 40 CFR 51.165 (b)), Nonattainment NSR (40 CFR 52.24, 40 CFR 51.165, 40 CFR part 51, Appendix S)

operate shall apply BACT to any new or modified source that could result in the potential to emit more than the levels shown in Table 3.

Table 2
New Source Review Significant Emission Rates

Emissions Type	Significant Emissions Rate (tpy)
ROG	40
NO_X	40
CO	100
SO_2	40
PM_{10}	15
$PM_{2.5}$	10

Notes: CO = carbon monoxide; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ROG = reactive organic gases; SO_2 = sulfur dioxide; tpy = tons per year.
Sources: BAAQMD 2005, EPA 2008.

Table 3
Best Available Control Technology and Offset Requirements

Emissions Type	BACT Emissions Level (lb/day)[1]	Offset Emissions Level (tpy)[2]
ROG	10	10
NO_X	10	10
CO	10	-
SO_2	10	100
PM_{10}	10	100

Notes: BACT = Best Available Control Technology; CO = carbon monoxide; lb/day = pounds per day; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ROG = reactive organic gases; SO_2 = sulfur dioxide; tpy = tons per year.
[1]The project size equivalent would be approximately 40 single-family dwelling units.
[2] The project size equivalent would be approximately 200 single-family dwelling units.
Source: BAAQMD 2005.

With respect to BAAQMD's Offset Requirements, before a permit to operate is issued for a new or modified source that could emit more than the levels specified in Table 3, federally enforceable emission offsets must be provided for the source's emissions and any preexisting cumulative increases. Emission offsets are verified reductions from an emission source that has shut down or has reduced its historical emissions through better control devices or modified operations. Verified offsets then can be used at a new or modified source and retired.

The aforementioned information serves as the bases for this option, which applies the federal PSD Significant Emission Rate limits to criteria air pollutants and precursors for which the SFBAAB is designated as attainment. For those pollutants the SFBAAB is designated as a nonattainment area, this option applies BAAQMD's Offset Requirement limits, except for PM_{10} and $PM_{2.5}$. Though the SFBAAB is currently designated as a nonattainment area for both PM_{10} and $PM_{2.5}$, the federal NSR Significant Emission Rate limits of 15 and 10 tpy, respectively, are recommended for this option as BAAQMD has not established an Offset Requirement limit for $PM_{2.5}$ and the existing limit of 100 tpy is much less stringent. The BACT Requirement limits as shown in Table 4 represent the levels at which, if exceeded, stationary sources must install common control devices. However, stationary source

are still allowed to result in emissions up to the offset requirement and above if federally enforceable offsets are provided. With respect to construction sources, analogous common control devices include increasingly stringent tailpipe standards for off-road equipment, after-market controls such as diesel particulate matter traps and oxidation catalysts.

The CARB new off-road regulations will require the use of newer equipment with lower emission rates and retrofitting of older equipment with after-market controls. These statewide regulations will essentially require the equivalent of installing BACT on all off-road construction equipment over the next several years. Therefore it would be appropriate to set a threshold level of significance at the NSR offset level to be consistent with this approach. Thus, utilization of the BACT Requirements as thresholds of significance for CEQA would result in achieving considerably more emission reductions from land use development than is needed to achieve air quality goals.

The federal NSR Significant Emission Rate and BAAQMD's Offset Requirement limits are identified in regulation on an annual basis (in units of tpy). For this option, the applicable limits were converted to maximum daily emissions (pounds per day) for each threshold of significance as shown in Table 4. This is appropriate because of the short-term intermittent nature of construction activities and if emissions would not exceed these maximum daily threshold emission levels on the worst-case day, then the project would also not exceed the annual levels even if such occurred every day for 365 days.

Table 4
Option 1 Threshold Emission Levels for Construction-Related Criteria Air Pollutants and Precursors

Emissions Type	Maximum Daily Emissions Level (lb/day)
ROG	54
NO_X	54
CO	547
SO_2	219
PM_{10}	82
$PM_{2.5}$	54

Notes: CO = carbon monoxide; lb/day = pounds per day; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ROG = reactive organic gases; SO_2 = sulfur dioxide.
Sources: Data compiled by EDAW 2009, BAAQMD 2005, EPA 2008.

All of these levels are adopted within current regulation and, thus, this option relies upon the associated legislation and rulemaking for federal NSR and BAAQMD, and associated definitions of significant emissions limits for criteria air pollutants and precursors.

2.2.2 GREENHOUSE GASES

A review of BAAQMD's GHG emissions inventory reveals greenhouse gas emissions from construction activity represent a relatively small portion (less than two percent) of the overall GHG emissions inventory in the SFBAAB. Regardless, BAAQMD staff has identified two potential approaches to set a significance threshold for construction GHG emissions.

2.2.2.1 OPTION 1: OPERATIONAL THRESHOLD APPROACH

This approach includes the same CEQA threshold of significance for construction-related GHG emissions as that for project operations, which is discussed in detail in section 3.3.3. Assuming that a project has an operational lifetime of approximately 30 years, the aggregate operational GHG emissions associated with a project that would generate 1,175 metric tons (MT) of carbon dioxide equivalent (CO_2e) emissions per year would result in an aggregate of 35,250 MT of CO_2e emissions over 30 years. Please refer to Option 1A under Operational-Related Greenhouse Gas Emissions. Thus, if a project would result in GHG emissions greater than 35,250 MT of CO_2e over the duration of construction, the impact would be considered significant.

2.2.2.2 OPTION 2: REGIONAL ALLOCATION APPROACH

The goal of this approach is to reduce the projected 2020 emissions associated with construction to the 1990 level, the overall goal of AB 32, by setting a per project threshold, that when aggregated, the total annual construction emissions would not exceed the total 1990 inventory levels in 2020. BAAQMD's current CO_2e emissions inventory estimated that in 1990 CO_2e emissions from construction activity were 1.3 million metric tons (MMT) CO_2e for off-road construction equipment. In addition, about five percent of the on-road medium/heavy duty truck CO_2e emissions inventory is attributed to construction debris and material haul trips, which equals 0.2 MMT CO_2e per year. Therefore, the total 1990 inventory for construction-related CO_2 emissions is 1.5 MMT, whereas the total projected 2020 construction-related emissions inventory is 2.9 MMT CO_2e. It is also estimated that approximately 4,000 development projects would be constructed in the SFBAAB between 2010 and 2020, or an average of 400 projects per year. The threshold of significance can be established by spreading the goal of 1.5 MMT over the 400 projects (1,500,000/400 equals 3,750 tons/year, or 10.3 tons/day). Therefore, projects with construction CO_2e emissions above 10 metric tons per day (tons/day) would be considered to have a significant impact.

2.2.3 TOXIC AIR CONTAMINANTS

2.2.3.1 OPTION 1: CASE-BY-CASE APPROACH

This approach entails using the "Expose sensitive receptors to substantial pollutant concentrations" question as contained in the State of California CEQA Appendix G checklist to determine the significance of construction-related TAC emissions on a case-by-case basis.

Basis and Analysis

Construction could result in the generation of diesel PM, which ARB has designated as a TAC, from the use of off-road heavy-duty equipment during site grading, excavation, material transport, paving, and other construction activities. However, due to the variable nature of such activities, the generation of TAC emissions in most cases would be temporary especially considering the short amount of time such heavy-duty equipment are typically within an influential distance (e.g., 70 percent reduction at approximately 500 feet from mobile sources [ARB 2005]) to nearby sensitive receptors (i.e., people or facilities that generally house people [e.g., schools, hospitals, residences]) that may experience adverse effects from unhealthful concentrations of air pollutants. In addition, current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities resulting in difficulties with producing accurate modeling results. Staff is currently assessing the size of a construction project where an assessment of the health risk to nearby receptors would be warranted. A recommended screening level for assessing a construction project's health risks will be provided in the methodologies section of the CEQA Guidelines update.

2.2.4 ODORS

Construction-related activities typically do not result in the generation of odor emissions. BAAQMD currently does not have a numeric significance threshold for construction-related odor impacts, but instead allows individual agencies to address this issue on a case-by-case basis, taking into consideration the specific construction-related characteristics of each project and proximity of off-site receptors.

2.3 OPERATIONAL-RELATED IMPACTS

2.3.1 CRITERIA AIR POLLUTANTS AND PRECURSORS (REGIONAL)

2.3.1.1 CURRENT APPROACH

At the project level, BAAQMD currently recommends that a proposed project that is estimated to generate criteria air pollutant or precursor emissions in excess of the annual or daily thresholds in Table 5 should be considered to have a significant air quality impact.

Table 5
Current BAAQMD Thresholds of Significance for Project-Level Operational-Related Criteria Air Pollutants and Precursors

Pollutant	Threshold (tpy)	Threshold (lb/day)	Threshold (kg/day)
ROG	15	80	36
NO_X	15	80	36
PM_{10}	15	80	36

Notes: kg/day = kilograms per day; lb/day = pounds per day; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ROG = reactive organic gases; tpy = tons per year.
Source: BAAQMD 1999.

These thresholds of significance would be exceeded by an unmitigated project size approximately equivalent to a 430-unit single family subdivision.

With respect to cumulative impacts, BAAQMD's current approach is that any proposed project (other than plans) that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact.

For any project that does not individually result in significant operational-related air quality impacts, the determination of a significant cumulative impact should 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 plan. (The appropriate regional air quality plan for the SFBAAB is the most recently adopted air quality plan [AQP] that has been developed in response to the CCAA.)

If a project is proposed in a city or county with a general plan that is consistent with the AQP and the project is consistent with that general plan (i.e., does not require a general plan amendment [GPA]), then the project would not have a significant cumulative impact (provided, of course, the project does not individually have any significant impacts). No further analysis regarding cumulative impacts is necessary.

In a jurisdiction with a general plan consistent with the AQP, a project may be proposed that is not consistent with that general plan because it requires a GPA. In such instances, the cumulative impact analysis should consider the

difference(s) between the project and the original (pre-GPA) land use designation for the site with respect to motor vehicle use and potential land use conflicts. A project would not have a significant cumulative impact if:

- Vehicle miles traveled (VMT) from the project would not be greater than the VMT that would be anticipated under the original land use designation, and

- The project would not result in sensitive receptors being in close proximity to sources of objectionable odors, TACs or accidental releases of hazardous materials.

For a project in a city or county with a general plan that is not consistent with the AQP, the cumulative impact analysis is based on the combined impacts of the proposed project and past, present and reasonably anticipated future projects. A project would have a significant cumulative impact if these combined impacts would exceed any of the thresholds established above for project operations.

The cumulative impact threshold of significance could affect all projects, regardless of size, and require mitigation for cumulative impacts.

2.3.1.2 OPTION 1: CLEAN AIR ACT EMISSIONS LIMIT APPROACH

This option is identical to Option 1 discussed above under Construction-Related Criteria Air Pollutants and Precursors; except this approach would use the annual in addition to the maximum daily levels as shown in Table 6. See the Clean Air Act description of NSR/PSD beginning on Page 5.

Basis and Analysis

For this option, operational-related criteria air pollutant and precursor emissions were estimated based on projected land use development in the SFBAAB using California Department of Finance and California Economic Development Department data. A sensitivity analysis of the threshold level was conducted for each nonattainment pollutant [ozone precursors (ROG and NO_x), PM_{10} and $PM_{2.5}$] in order to determine reasonable emission capture rates based on NSR/PSD thresholds. Emission capture rates are hereafter defined as the proportion of project-generated emissions that would exceed the CEQA threshold of significance and would thereby be subject to mitigation. The sensitivity analysis involved adjusting the mass emissions threshold level in order to develop a matrix of emission reduction scenarios. Please refer to Table 8 for the results of the sensitivity analysis.

Table 6
Option 1 Threshold Emission Levels for Operational-Related Criteria Air Pollutants and Precursors

Emissions Type	Annual Emissions Level (tpy)	Maximum Daily Emissions Level (lb/day)
ROG	10	54
NO_X	10	54
CO	100	547
SO_2	40	219
PM_{10}	15	82
$PM_{2.5}$	10	54

Notes: CO = carbon monoxide; lb/day = pounds per day; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ROG = reactive organic gases; SO_2 = sulfur dioxide; tpy = tons per year.
Sources: Data compiled by EDAW 2009, BAAQMD 2005, EPA 2008.

Methodology and Information Sources

Development Projections

EDAW calculated growth projections for new land use development in the SFBAAB from 2010 to 2020 based on the following two data sets: (1) the California Department of Finance (DOF) projections for population, household size, and residential unit distribution (DOF 2009); and (2) the California Economic Development Department (EDD) for employment projections by North American Industry Classification System (NAICS) code (EDD 2009). These data sources were selected primarily because DOF and EDD have a long history and good track record of projecting growth estimates, and because they do so on a statewide level, thereby considering allocations between regions. This data was also reported at a level of specificity that allows for simple translation into land use type categories consistent with those in the Urban Emissions Model (URBEMIS). URBEMIS includes general land use categories (e.g., residential, educational, recreational, commercial, retail, and industrial). Within each general category there are several specific land use types resulting in a total of 52 possible land use types. Please refer to Exhibit 1 for a graphical representation of the derivation process for this concept for the single family residential land use type.

Data from the Association of Bay Area Governments (ABAG) was available, but not at the land use category resolution required for conversion into URBEMIS. Notwithstanding, the DOF/EDD data were not at a fine enough resolution to develop projections for every URBEMIS land use category. In instances of asymmetry between the DOF/EDD data and the URBEMIS land use categories, development projections were aggregated into the most similar URBEMIS category based on density and behavioral trip capture (i.e., trip generation rates) assumptions. The NAICS data projected less development over the next ten years in comparison to ABAG, thus, making the NAICS dataset more conservative for the purposes of this threshold evaluation, because fewer projects (and fewer associated emissions) would be available for capture by the threshold. In other words, the emissions reduction potential of the CEQA threshold would be lower using more conservative development projections. If more development occurs than was expected under the growth projections, the emissions reduction potential associated with the CEQA significance threshold would be greater than assumed in this analysis. Please refer to Appendix A for detailed land use development projections and associated emissions calculations.

For residential development, the DOF population, household size, and residential unit distribution projections were used to calculate population-driven residential square footage projections. For non-residential development, EDD projections for employment by NAICS code were used to calculate employment-driven commercial, retail, and industrial development square footage projections. Using type and size distribution data from projects in the SFBAAB that passed through the CEQA process from 2001–2008, the development square footage annual projections were translated into units and project size distributions for each URBEMIS land use category. This analysis then uses the project type and size distributions to develop a projected development inventory for new development that would occur over the next ten years (i.e., 2010–2020). Please refer to Appendix B for detailed development projections calculations.

Project Characteristics

The CEQA Projects Database (Rimpo and Associates 2009), which includes information from environmental documents prepared by lead agencies within BAAQMD's jurisdiction and filed with the California State Clearinghouse (SCH) during the past eight years (2001-2008), was used by EDAW to conduct a frequency analysis of projects categorized by land use type and size. Projects for which an Environmental Impact Report (EIR) or Initial Study/Mitigated Negative Declaration (IS/MND) was prepared during the last eight years were distributed over size intervals of 50,000 square feet (sf) by each corresponding URBEMIS land use category to develop frequency distributions of project type and size. These frequency distributions were applied to the total development projections to obtain development forecasts by project size and type in the SFBAAB. This development forecast dataset represents the manner in which the projected development will come under the

purview of CEQA in terms of project type and size. It was assumed that past projects proposed in the SFBAAB Area are indicative of project attributes in the future.

It was necessary to forecast these attributes into the future to model the mass emissions for projects of different types and sizes in order to evaluate the sensitivity (e.g., emissions reduction and capture rates) of the threshold level for each pollutant. Projects of a certain size would trigger the CEQA threshold, and would require mitigation. The sensitivity analysis involved adjusting the threshold in order to achieve a balance that attains a reasonable (feasible) amount of emissions reduction.

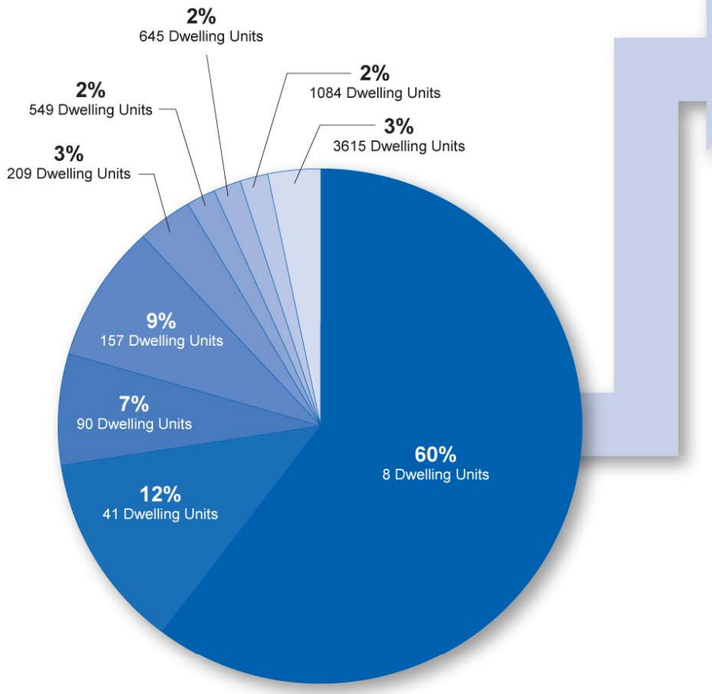
It is important to note that there is some unknown amount of projected development included in the forecast totals that would not be subject to CEQA, because some of the projected development included in the DOF/EDD data would be categorically (e.g., certain infill development projects in urban areas [Class 32; CEQA Guidelines Section 15332]) or statutorily exempt (e.g., actions related to construction of less than 100 low-income housing units in urban areas [California Public Resources Code 21080.14]). Our presumption is that the quantity of potential development that is exempt is not considerable. Data to support this conclusion is incomplete, despite EDAW's attempt to acquire it throughout the State. First, Notices of Exemption (NOE) are not required to be posted or filed for exempt projects; they are voluntary. Furthermore, NOEs are not required to be filed with the SCH unless a State agency serves as the CEQA lead agency. Otherwise, NOEs only need be filed with the County Clerk's office. NOEs filed with the SCH represent a small portion of total NOEs, and rarely do NOEs where the State is the lead agency represent development that could be categorized within URBEMIS. Typically, NOEs accompany ministerial actions that do not result in actual development, such as the subdivision of land or modification of an existing use. Further, it is our experience that many exempt development projects are, at some point, largely captured under CEQA, such as through an EIR prepared for a proposed subdivision. The exemption would apply to the building permits for already evaluated projects, in this instance. Projects that are not exempt are typically small, or would otherwise not meet a category that exempts the projects (plus lead agencies cannot, under CEQA, categorically exempt projects that considerably contribute to cumulative impacts or may have potentially significant impacts). Thus, it was concluded that NOEs represent a less-than-substantial portion of total projected development in the SFBAAB.

Next, an emissions inventory for new development that would fall under the purview of CEQA was calculated. This quantity of unmitigated emissions of precursors and particulate matter (i.e., approximately 2,848–12,322 tpy as shown in Table 7) would be considered to potentially conflict with current attainment planning efforts and would thereby be cumulatively considerable.

By its very nature, air pollution is largely a cumulative impact. Ambient air quality standards are violated or approach nonattainment levels due to past development that has formed the urban fabric, and attainment of standards can be jeopardized by adding projects to the existing development inventory. The non-attainment status of regional pollutants is a result of past and present development within the SFBAAB. Without the large scale of development that has occurred throughout the SFBAAB, nonattainment would not have occurred. Thus, this regional impact is a cumulative impact, and projects would adversely affect this impact only on a cumulative basis. No single project would be sufficient in size, by itself, to result in nonattainment of the regional air quality standards. Consequently, the threshold of significance is that amount of pollution that is deemed cumulatively considerable and therefore a significant adverse air quality impact.

BAAQMD Single Family Residential Development Projections:

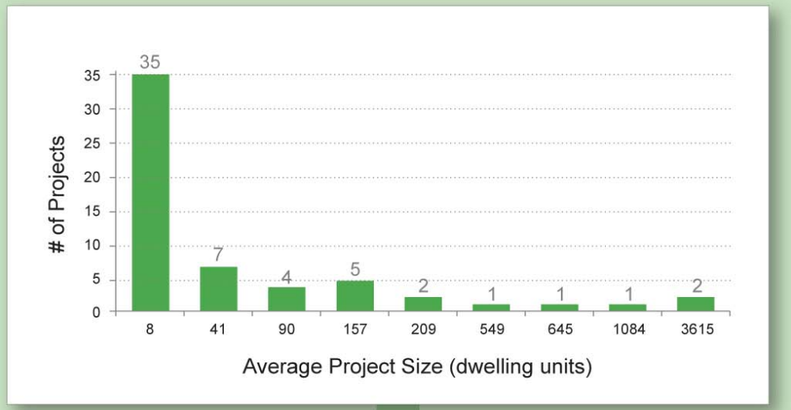
# of new dwelling units in 2020 = 11,638



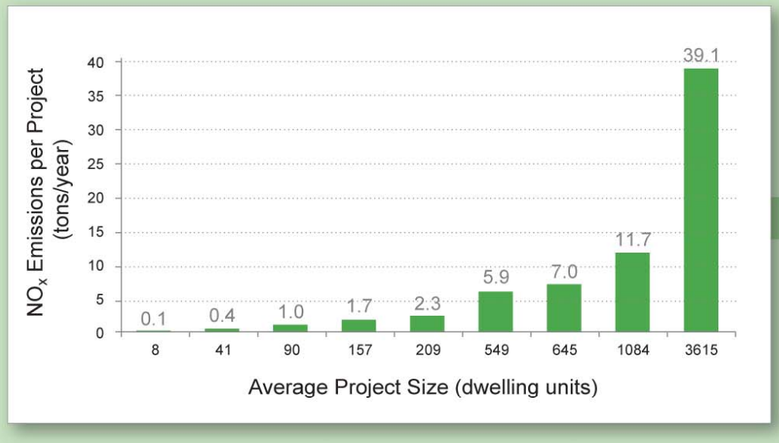
CEQA Projects Database

provides size distribution of past projects (2001-2008) in BAAQMD

Operational Year 2020 Projections



BAAQMD Projected Projects[1]



URBEMIS Operational Emissions Modeling Example[2]

Notes:

Though this exhibit only pertains to single-family development, the year 2020, and the pollutant NO_x; please note that this exercise was performed for all applicable land use types, years, and pollutants for the purposes of this threshold evaluation report.

1. Applies the past project size distribution data to the 2020 development projection for the purpose of predicting how the 11,638 dwelling units will be built out in terms of the project frequency of occurrence (#) by average size bin.
2. For each average project size bin, the amount of emissions were modeled and multiplied by the total number of corresponding projects.

BAAQMD Projected Land Use Development Emissions Inventory

(Single Family Residential Projects Subject to CEQA)

Year 2020 = 126.2 tons/year NO_x

Perform Sensitivity Analysis

(Adjust Threshold Bar and Mitigation Effectiveness to Determine Emission Reduction Potential)

G 08110224.01 003

Notes: BAAQMD = Bay Area Air Quality Management District; CEQA = California Environmental Quality Act; NO_x = oxides of nitrogen; tons/year = tons per year; URBEMIS = Urban Emissions Model.
Source: Data adapted by EDAW 2009.

Example Derivation from BAAQMD Single-Family Residential Development Projections **Exhibit 1**

Table 7
Unmitigated Criteria Air Pollutants and Precursors from Projected Development Subject to CEQA in the San Francisco Bay Area Air Basin

Year	Number of Projects/Yr	Unmitigated[1] Emissions (tpy)				Aggregate Unmitigated [1] Emissions Between 2010-2020 (Tons)			
		ROG	NO_X	PM_{10}	$PM_{2.5}$	ROG	NO_X	PM_{10}	$PM_{2.5}$
2010	366	911	856	1,121	259	-	-	-	-
2015	404	777	618	1,240	287	-	-	-	-
2020	436	725	463	1,336	308	8,045	6,453	12,322	2,848

Notes: CEQA = California Environmental Quality Act; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ROG = reactive organic gases; tpy = tons per year; yr = year.

[1] Unmitigated emissions are the results of an URBEMIS model run using default model settings, including default (i.e., worst-case) trip generation rates and average trip length assumptions. The modeling does not account for project attributes that may reduce emissions relative to the default settings (i.e., full trip generation) scenario, such as proximity to transit or mix of land use types. Please refer to Appendix B for detailed unmitigated emissions calculations.

Sources: Data calculated by EDAW 2009, Rimpo and Associates 2009, DOF 2009, EDD 2009.

As discussed previously, a frequency distribution of project sizes and types was calculated based on the last eight years of data from the CEQA Projects Database. Project size intervals (i.e., "bins") of 50,000 sf (approximately 28 single family homes) were used to assess the sensitivity of operational criteria air pollutant and precursor threshold levels at different increments to determine a reasonable emissions capture rate which achieves a feasible (as defined by CEQA) amount of emission reductions when considering mitigation effectiveness.

Threshold Level Sensitivity Analysis

Based on the project-level data from the development projections that were used to calculate the unmitigated amount of criteria air pollutants and precursors shown in Table 8, EDAW conducted a sensitivity analysis of operational-related mass emission threshold levels for ROG, NO_X, PM_{10}, and $PM_{2.5}$. This was done to determine the number of occurrences wherein such levels would be exceeded by projected development subject to CEQA. In situations where development would exceed these threshold levels, CEQA requires implementation of feasible mitigation, to the extent that this impact is reduced to below significance. Feasible means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors (California Administrative Code, Title. 14, § 15364; California Public Resources Code, § 21061.1.). BAAQMD would achieve emissions reductions from new development associated with implementation of feasible mitigation.

EDAW has considerable experience evaluating operational emission reductions associated with land use development projects in California. Reductions of 15 percent in operational emissions typically are achievable when considering standard (i.e., not "smart growth") projects. A reasonable and demonstrable amount of feasible mitigation can be required of projects, at least to the extent they are not already planned with emissions-reducing characteristics. If mitigation is deemed infeasible, CEQA allows lead agencies to override any remaining significant impacts provided certain findings are made. Thus, since a 15 percent reduction in operational emissions from an unmitigated (i.e., full trip generation URBEMIS default model run) baseline is a practicable amount of mitigation, as demonstrated in nearby jurisdictions, 15 percent mitigation effectiveness was assumed for the purposes of this analysis. It was assumed that all of the projects that would trigger the CEQA thresholds would attempt to mitigate their emissions by at least 15 percent or down to the level of the threshold as required by CEQA.[2] It is the policy of the state that public agencies should not approve projects as proposed if there are

[2] (California Public Resources Code Section 21002; *See Laurel Heights I*, 47 Cal.3d at 400-401)

feasible alternatives or feasible mitigation measures which will avoid or substantially lessen the significant environmental effects of such projects.

Results of the threshold sensitivity analysis are presented in Table 8.

For criteria air pollutants for which the SFBAAB is currently in attainment (e.g., CO, SO_2), the operational thresholds were not evaluated in the sensitivity analysis because it is not foreseeable that there would be any impacts that could cause a violation of the CAAQS. Concentration levels of CO in the SFBAAB have not exceeded the CAAQS in the past 11 years and sulfur dioxide (SO_2) concentrations have never exceeded the standards (EPA 2009). BAAQMD has demonstrated that attainment pollutants are sufficiently controlled by air quality plans and regulations, thus, significant air quality impacts for CO and SO_2 emissions would not be expected to occur as a result of a project's operational-related emissions.

2.3.1.3 OPTION 2: CALIFORNIA CLEAN AIR ACT APPROACH

This approach is similar to Option 1, but uses a measurement of percent emissions reduction relative to the total emissions inventory as the supporting basis for each threshold level.

Basis

The CCAA requires a five percent per year reduction from the total emissions inventory. If a nonattainment area cannot achieve the five percent per year goal, the CCAA requires the area to implement all feasible measures to attain the state standards as soon as possible. The CEQA threshold developed in this section will contribute a portion of that five percent per year requirement. If compounded annually between 2010 and 2020, a total of 38.75 percent reduction from the emissions inventory would be required.

Analysis

Table 10 summarizes the quantity of BAAQMD's emissions inventory reduction required by the CCAA during the period from 2010 through 2020 in tons/day. Table 10 summarizes the amount of emissions reduction that could be achieved through the different CEQA significance threshold levels evaluated. The values in Table 10 were calculated in the same manner as in Option 1, except in units of tons/day. The column labeled "% Toward CCAA Requirement" lists the portion of the CCAA requirement that would be achieved through the various CEQA significance threshold levels. None of the threshold levels evaluated in this option would achieve the full 5 percent per year requirement. The remaining emission reductions would need to be achieved through other control measures and regulations in BAAQMD's jurisdiction.

Table 8
Option 1 Operational-Related Criteria Air Pollutant and Precursor Threshold Level Sensitivity Analysis
(Unmitigated Emissions from Land Use Development between 2010 and 2020)

Basis of Threshold	Mass Emissions Threshold Level (tpy)				Mitigation Effectiveness for Projects with Emissions >Threshold Level	Aggregate Emissions Reduction from Mitigation Between 2010–2020 (Tons)				% Project Capture[1]				% Emissions Capture [1]				Project Size Equivalent (number of single family dwelling units) [2]
	ROG	NO_X	PM_{10}	$PM_{2.5}$		ROG	NO_X	PM_{10}	$PM_{2.5}$	ROG	NO_X	PM_{10}	$PM_{2.5}$	ROG	NO_X	PM_{10}	$PM_{2.5}$	
NSR (Significant Emissions Rate)	40	40	15	10	15%	1,102	229	1,867	344	1%	0%	2%	1%	31%	0%	31%	23%	523
(BAAQMD Rule 2, Offset)	10	10	100	-	15%	1,033	1,137	32	-	2%	1%	0%		43%	25%	16%	-	396
5 tpy Level[3]	5	5	5	5	15%	1,518	1,008	2,555	533	5%	2%	9%	1%	57%	33%	52%	30%	198
BAAQMD (Rule 2, BACT)	1.8	1.8	1.8	1.8	15%	2,028	1,496	3,457	510	14%	10%	58%	7%	73%	53%	92%	52%	62

Notes: BAAQMD = Bay Area Air Quality Management District; BACT = Best Available Control Technology; NSR = New Source Review; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ROG = reactive organic gases; tpy = tons per year.
[1] Emissions capture refers to the portion of emissions that would exceed the CEQA significance threshold and would thereby be subject to mitigation. Similarly, project capture refers to the portion of projects that would result in emissions that exceed the CEQA significance threshold and would be subject to mitigation.
[2] Project size equivalent is determined by the limiting pollutant (i.e., whichever threshold is exceeded first).
[3] The mass emission level of 5 tpy represents a moderate scenario between offset levels and BACT levels. 5 tpy is not based on regulation or defined by BAAQMD as an emissions level of importance, but presented here for informational purposes only.
Please refer to Appendix C for detailed unmitigated emissions calculations.
Sources: Data calculated by EDAW 2009, DOF 2009, EDD 2009, Rimpo and Associates 2009.

Table 9
San Francisco Bay Area Air Basin Emissions Inventory with California Clean Air Act Five Percent per Year Emissions Reduction Goal

BAAQMD Emissions Inventory (2010) (tons/day)				CCAA % reduction (over 2010–2020)	BAAQMD Inventory with CCAA Required Reduction (2020) (tons/day)				Difference (CCAA Reduction) (tons/day)			
ROG	NO_X	PM_{10}	$PM_{2.5}$		ROG	NO_X	PM_{10}	$PM_{2.5}$	ROG	NO_X	PM_{10}	$PM_{2.5}$
335.5	449.6	216.1	87.9	38.75%	205.5	275.4	132.4	53.9	130.0	174.2	83.8	34.1

Notes: BAAQMD = Bay Area Air Quality Management District; CCAA = California Clean Air Act; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 microns or less; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 microns or less; ROG = reactive organic gases; tons/day = tons per day.
Source: BAAQMD 2009.

Table 10
Option 3 Operational-Related Criteria Air Pollutant and Precursor Threshold Level Sensitivity Analysis

	Mass Emissions Threshold Level (tpy)				Mitigation Effectiveness for Projects with Emissions > Threshold Level	Emissions Reduction From Mitigation Between 2010–2020 (tons/day)				% Toward CCAA Requirement				Project Size Equivalent (number of single family dwelling units)[1]
	ROG	NO_X	PM_{10}	$PM_{2.5}$		ROG	NO_X	PM_{10}	$PM_{2.5}$	ROG	NO_X	PM_{10}	$PM_{2.5}$	
NSR (Significant Emissions Rate)	40	40	15	10	15%	0.30	0.06	0.51	0.09	0.2%	0.0%	0.6%	0.3%	523
(BAAQMD Rule 2, Offset)	10	10	100	-	15%	0.28	0.31	0.01	-	0.2%	0.2%	0.0%	-	396
5 tpy Level[2]	5	5	5	5	15%	0.42	0.28	0.70	0.15	0.3%	0.2%	0.8%	0.4%	198
BAAQMD (Rule 2, BACT)	1.8	1.8	1.8	1.8	15%	0.56	0.41	0.95	0.14	0.4%	0.2%	1.1%	0.4%	62

Notes: BAAQMD = Bay Area Air Quality Management District; BACT = Best Available Control Technology; CCAA = California Clean Air Act; NSR = New Source Review; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter with an aerodynamic resistance diameter of 2.5 microns or less; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 microns or less; ROG = reactive organic gases; tons/day = tons per day; tpy =tons per year.

[1] Project size equivalent is determined by the limiting pollutant (i.e., whichever threshold is exceeded first).

[2] The mass emission level of 5 tpy represents a moderate scenario between offset levels and BACT levels. 5 tpy is not based on regulation or defined by BAAQMD as an emissions level of importance, but presented here for informational purposes only.

Please see Table 9 for % project and emission capture rates associated with these mass emission levels.

Please refer to Appendix C for detailed unmitigated emissions calculations.

Sources: Data calculated by EDAW 2009, DOF 2009, EDD 2009, Rimpo and Associates 2009.

2.3.2 LOCAL CARBON MONOXIDE

2.3.2.1 CURRENT APPROACH

The current approach is based on ambient concentration limits set by the California Clean Air Act for Carbon Monoxide and Appendix G of the State CEQA Guidelines.

2.3.2.2 BASIS AND ANALYSIS

State ambient air quality standards for carbon monoxide provide the most appropriate metric for determining if a new land use project would have a significant impact to local and regional air quality. Carbon monoxide is a directly emitted pollutant with primarily localized adverse effects when concentrations exceed the health based standards established by the California Air Resources Board (ARB). In addition, Appendix G of the State of California CEQA Guidelines includes the checklist question: Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation? Answering yes to this question would indicate that the project would result in a significant impact under CEQA. Since the ambient air quality standards are health-based (i.e., protective of public health), there is substantial evidence in support of their use as CEQA significance thresholds.

2.3.3 GREENHOUSE GASES

2.3.3.1 CURRENT APPROACH

BAAQMD does not currently have an adopted threshold of significance for GHG emissions. BAAQMD currently recommends that lead agencies quantify GHG emissions resulting from new development and apply all feasible mitigation measures to lessen the impact. One of the primary objectives in updating the current CEQA Guidelines is to identify a GHG significance threshold, analytical methodologies, and mitigation measures to ensure new land use development meets its fair share of the emission reductions needed to address the cumulative environmental impact of GHG emissions. GHG CEQA significance thresholds evaluated herein are intended to serve as interim levels during the implementation of the AB 32 Scoping Plan and SB 375, which will occur over a few years time. Until AB 32 and SB 375 have been fully implemented, or ARB adopts a recommended threshold, the BAAQMD recommends that local agencies in the SFBAAB apply the interim GHG threshold developed herein.

2.3.3.2 SCIENTIFIC AND REGULATORY JUSTIFICATION

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, chlorofluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the greenhouse effect and have led to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is *extremely unlikely* that global climate change of the past 50 years can be explained without the contribution from human activities (IPCC 2007).

According to Article 2 of the United Nations Framework Convention on Climate Change (UNFCCC), "Avoiding Dangerous Climate Change" means: *"stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."* Dangerous climate change was defined based on several key indicators including the potential for severe degradation of coral reef systems, disintegration of the West Antarctic Ice Sheet, and shut down of the large-scale, salinity- and thermally-driven circulation of the oceans. "Avoiding dangerous climate change" is expected to be achieved by stabilizing global average temperatures at a maximum of 2°C above pre-industrial levels. In order to stabilize at a global equilibrium temperature of 2–2.4°C above pre-industrial levels, ambient CO_2 concentrations must stabilize at 350–400 ppm. Ambient global CO_2 concentrations in 1990 were approximately 353 ppm (UNFCCC 2009).

Executive Order S-3-05

Executive Order S-3-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

In September 2006, Governor Arnold Schwarzenegger signed Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, which set the 2020 greenhouse gas emissions reduction goal into law. AB 32 finds and declares that "Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California." AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020, and establishes regulatory, reporting, voluntary, and market mechanisms to achieve quantifiable reductions in GHG emissions to meet the statewide goal.

In October of 2008, ARB published its *Climate Change Proposed Scoping Plan* (*Proposed Scoping Plan*), which is the State's plan to achieve GHG reductions in California required by AB 32 (ARB 2008). The *Proposed Scoping Plan* contains the main strategies California will implement to achieve a reduction of 169 MMT CO_2e emissions, or approximately 30 percent from the state's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 42 MMT of CO2e, or almost 10 percent, from 2002-2004 average emissions) so that the state can return to 1990 emission levels, as required by AB 32. The *Proposed Scoping Plan* was approved by ARB on December 11, 2008.

Senate Bill 375

Senate Bill (SB) 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years, but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012. New provisions of CEQA would incentivize qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

2.3.3.3 OPTION 1: PLAN-BASED APPROACH

This approach sets a GHG significance threshold based on AB 32 GHG emission reduction goals while taking into consideration emission reduction strategies outlined in ARB's Scoping Plan. Within Option 1, there are three sub-options to consider, which are described below. BAAQMD took eight essential steps in developing this Plan-Based Approach.

Step 1. Estimate from ARB's statewide GHG emission inventory the growth in emissions between 1990 and 2020 attributable to "land use"-driven sectors of the emission inventory per OPR's guidance document.

Step 2. Estimate the GHG emission reductions anticipated statewide to these same "land use" -driven emission inventory sectors associated with adopted regulations identified in the AB 32 Scoping Plan.

Step 3. Determine any short fall or "gap" between the 2020 statewide emission inventory estimates and the anticipated emission reductions from Scoping Plan adopted regulations. This "gap" represents additional GHG emission reductions needed statewide from these "Land use"-driven emissions inventory sectors, which represents new land development's fair share of the emission reductions needed to meet statewide GHG emission reduction goals.

Step 4. Determine the percent reduction this "gap" represents in the "land use"-driven statewide emissions inventory sectors and apply that percent to the same GHG emissions inventory sectors from BAAQMD's GHG emission inventory to identify the mass of emission reductions needed in the SFBAAB from "land use"-driven emission inventory sectors.

Step 5. Forecast new land use development for the SFBAAB using DOF/EDD projections for all land use types. Translate the land use development projections into land use categories consistent with those contained in the Urban Emissions Model (URBEMIS).

Step 6. Apply BAAQMD's CEQA database to projected new land use development to determine the frequency distribution of project sizes and types that would be expected to see come through the CEQA process in the SFBAAB between 2010 and 2020.

Step 7. Estimate mitigation effectiveness for GHG emission reductions for all land use development projects subject to CEQA.

Step 8. Conduct a sensitivity analysis of the numeric GHG mass emissions threshold needed to achieve the desired emission reduction (i.e., "gap") determined in Step 4. This mass emission GHG threshold is that which would be needed to achieve the emission reductions necessary by 2020 to fill the SFBAAB's fair share of the statewide "gap" in emission reductions needed from the "land use"-driven emission inventory sectors to meet AB 32 goals.

Basis and Analysis

Derivation of Greenhouse Gas Reduction Goal

To meet the target emissions limit established in AB 32 (equivalent to levels in 1990), total GHG emissions would need to be reduced by approximately 30 percent from projected 2020 forecasts (ARB 2009a). The AB 32 Scoping Plan is ARB's plan for meeting this mandate (ARB 2008). While the Scoping Plan does not specifically identify GHG emission reductions from the CEQA process for meeting AB 32 derived emission limits, the scoping plan acknowledges that "other strategies to mitigate climate change should also be explored." The Scoping Plan also acknowledges that "Some of the measures in the plan may deliver more emission reductions than we expect; others less and new ideas and strategies will emerge." In addition, climate change is considered a significant environmental issue and, therefore, warrants consideration under CEQA. SB 97 represents the State Legislature's confirmation of this fact, and it directed the Governor's Office of Planning and Research (OPR) to develop CEQA Guidelines for evaluation of GHG emissions impacts and recommend mitigation strategies. In response, OPR released the *Technical Advisory: CEQA and Climate Change* (OPR 2008), and has released proposed CEQA guidelines (April 14, 2009) for consideration of GHG emissions. It is known that new land use development must also do its fair share toward achieving AB 32 goals (or, at a minimum, should not hinder the State's progress toward the mandated emission reductions).

If left unchecked, GHG emissions from new land use development in California may result in a cumulatively considerable amount of GHG emissions and a substantial conflict with the State's ability to meet the goals within AB 32. Thus, BAAQMD has elected to adopt an interim GHG threshold for CEQA analysis, which can be used by lead agencies within the SFBAAB. This would help these lead agencies navigate this dynamic regulatory and technological environment where the field of analysis has remained wide open and inconsistent. BAAQMD's

framework for developing a GHG threshold for land development projects that is based on policy and substantial evidence follows, and is detailed in Appendix D.

Foreseeable Emissions Reductions from the Scoping Plan Measures

As stated above, to meet the requirements set forth in AB 32 (i.e., achieve California's 1990-equivalent GHG emissions levels by 2020) California would need to achieve an approximate 30 percent reduction in emissions across all sectors of the GHG emissions inventory compared with 2020 projections. However, to meet the requirements of AB 32 in the emissions sectors that are related to land use development (e.g., on-road passenger and heavy-duty motor vehicles, commercial and residential area sources [i.e., natural gas], electricity generation/consumption, waste water treatment, and water consumption), California would need to achieve an approximate 24 percent reduction in GHG emissions from these "land use-driven" sectors (ARB 2009a) by 2020. GHG emission reductions within these land use-driven sectors that are anticipated to occur from implementation of the Scoping Plan measures statewide are summarized in Table 11. Since the GHG emission reductions anticipated with the Scoping Plan were not accounted for in ARB's or BAAQMD's 2020 GHG emissions inventory forecasts (i.e., business as usual), an adjustment was made to include (i.e., give credit for) GHG emissions reductions associated with adopted legislation only, such as SB 107, the California Green Building Code (GBC), AB 1493 (Pavley) (though adopted, AB 1493 has not been implemented at the time of writing), and a portion of the reduction anticipated from the Low Carbon Fuel Standard (LCFS). With reductions from these State regulations (Scoping Plan measures) taken into consideration, California would still need to achieve a 2.8 percent reduction from projected 2020 GHG emissions to meet the 1990 GHG emissions goal from these "land-use driven" sectors. Refer to Tables 11 through 13 for data used in this analysis and Appendix C for detailed calculations.

Assembly Bill 1493 and the Low Carbon Fuel Standard

AB 1493 (Pavley) is intended to regulate CO_2 emissions from passenger vehicles; however, AB 1493 has not been implemented at the time of writing, because California has not received federal approvals to implement these emissions standards. It appears likely that AB 1493 will be implemented in the near future, as the new presidential administration has directed EPA to reexamine its position for denial of CCAA's waiver and for its past opposition to GHG emissions regulation. It appears likely that California will receive the waiver sometime in 2009, notwithstanding the previous denial by EPA.

Table 11
Foreseeable Greenhouse Gas Emission Reductions from State Regulations and Legislation

Affected Emissions Source	California Legislation	% Emissions Reduction from 2020 GHG inventory	Year of Effect	End Use Sector (% of Total Inventory)	Scaled % Emissions Reduction (credit)
Mobile	AB 1493 (Pavley)	19.7%	2020	On road transportation (44%)	8.6%
	LCFS	2%	2020	On road transportation (44%)	0.9%
Area	GBC	8.5% Residential	2010	Natural gas (Residential, 10%)	0.7%
		9.4% Non-residential		Natural gas (Non-residential, 4%)	0.4%
Indirect	SB 1078, 107	20%	2010	Electricity (In-State Generation, 17%)	3.0%
	GBC	21.2% Residential	2010	Electricity (34%)	7.6%
		4.9% Non-residential	2010		
Total credits given to land use-driven emission inventory sectors from Scoping Plan measures					**21.1%**[1]

Notes: AB = Assembly Bill; GBC = California Green Building Code; LCFS = Low Carbon Fuel Standard; SB = Senate Bill.
[1] Percentages do not sum to 21.1% exactly in table due to rounding.
Please refer to Appendix D for detailed calculations.
Sources: Data calculated by EDAW 2009, CEC 2007.

Table 12
California's Greenhouse Gas Emissions Inventory, 1990 Emissions Limit, and 2020 Projections from Land Use-Related Sectors

Sector	1990 Emissions (MMT CO_2e/yr)	2002-2004 Average (MMT CO_2e /yr)	2020 Emissions Projections (MMT CO_2e/yr)	% of Total
Transportation	**137.992**	**168.657**	**209.101**	**57%**
On-Road Passenger Vehicles	108.945	133.947	160.783	44%
On-Road Heavy Duty	29.047	34.710	48.318	13%
Electric Power	**95.385**	**88.970**	**107.401**	**29%**
In-State Generation	33.808	32.152	55.039	15%
Imported Electricity	61.577	56.818	52.362	
Commercial and Residential	**44.220**	**41.579**	**47.970**	**13%**
Residential Fuel Use	29.657	28.515	32.100	9%
Commercial Fuel Use	13.462	11.704	13.755	4%
Commercial Combined Heat and Power	1.101	1.360	2.115	
Recycling and Waste[1]	**2.833**	**3.390**	**4.190**	**1%**
Domestic Waste Water Treatment	2.833	3.390	4.190	
TOTAL GROSS EMISSIONS	**280.430**	**302.596**	**368.662**	
% Reduction Goal from Statewide land use driven sectors (from 2020 levels to reach 1990 levels within these emission inventory sectors)			23.9%	
% Reduction from AB 32 Scoping Plan measures applied to land use driven sectors (Refer to Table 12)			-21.1%	
% Reduction needed statewide beyond Scoping Plan measures (Gap)			2.8%[2]	

Notes: AB = Assembly Bill; MMT CO_2e /yr = million metric tons of carbon dioxide equivalent emissions per year.

[1] Landfills not included.

[2] Represents an upper bound for the % emissions reduction that can be achieved through the GHG CEQA significance threshold. Please refer to Appendix D for detailed calculations.

Sources: Data compiled by EDAW 2009, ARB 2009a.

Table 13
San Francisco Bay Area Air Basin's Greenhouse Gas Emissions Inventory, 1990 Emissions Limit, and 2020 Projections from Land Use-Related Sectors

Sector	1990 Emissions (MMT CO_2e /yr)	2007 Emissions (MMT CO_2e /yr)	2020 Emissions Projections (MMT CO_2e /yr)	% of Total[2]
Transportation	**26.1**	**30.8**	**35.7**	**50%**
On-Road Passenger Vehicles	23.0	27.5	32.0	
On-Road Heavy Duty	3.1	3.3	3.7	
Electric Power	**25.1**	**15.2**	**18.2**	**26%**
In-State Generation	16.2	8.1	9.9	
Imported Electricity	8.9	7.1	8.3	
Commercial and Residential	**8.9**	**15.0**	**16.8**	**24%**
Residential Fuel Use	5.8	7.0	7.5	
Commercial Fuel Use	3.1	8.0	9.3	
Recycling and Waste[1]	**0.2**	**0.4**	**0.4**	**1%**
Domestic Waste Water Treatment	0.2	0.4	0.4	
TOTAL GROSS EMISSIONS	**60.3**	**61.4**	**71.1**	
SFBAAB's "Fair Share" % Reduction (from 2020 levels to reach 1990 levels) with Regulatory Reductions (from Table 13)			2.8%[3]	
SFBAAB's Equivalent Mass Emissions Reduction Target at 2020			2.0[3]	

Notes: MMT CO_2e /yr = million metric tons of carbon dioxide equivalent emissions per year; SFBAAB = San Francisco Bay Area Air Basin.
[1] Landfills not included.
[2] Percentages do not sum exactly to 100% in table due to rounding.
[3] Represents an upper bound for the % and mass emissions reduction that can be achieved through the GHG CEQA significance threshold. Please refer to Appendix D for detailed calculations.
Sources: Data compiled by EDAW 2009, BAAQMD 2008.

The CO_2 reduction associated with the foreseeable implementation of AB 1493 is currently unknown. The AB 32 Scoping Plan assigns an approximate 20 percent reduction in emissions from passenger vehicles associated with the implementation of AB 1493. The AB 32 Scoping Plan also notes that "AB 32 specifically states that if the Pavley regulations do not remain in effect, ARB shall implement alternative regulations to control mobile sources to achieve equivalent or greater reductions of greenhouse gas emissions (HSC § 38590)." Thus, it is reasonable to assume full implementation of AB 1493 standards, or equivalent programs that would be implemented by ARB.

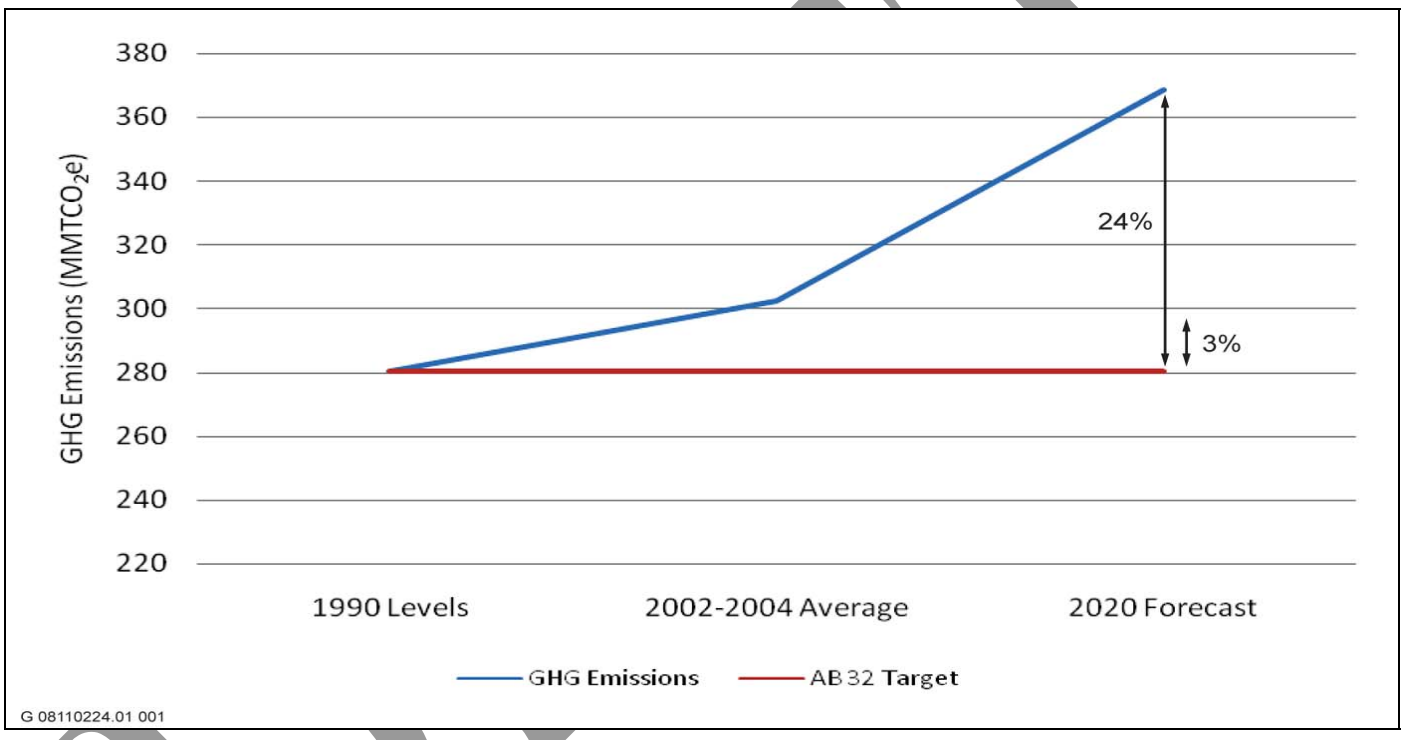
In addition, according to the Scoping Plan, the LCFS is expected to result in approximately 9.3 percent reduction in the carbon intensity of transportation fuels. However, it is possible that some portion of the emissions reductions required from the LCFS would be achieved over the life cycle of transportation fuel production rather than from mobile-source emission factors. The actual amount of GHG emission reduction that could be expected from motor vehicles from LCFS implementation is unknown. It was conservatively assumed that on-road passenger vehicle emission factors would be reduced by 2 percent, and the remaining 7.3 percent reduction would occur at refineries during fuel production.

Because the transportation sector is the largest emissions sector of the state's GHG emissions inventory, it is reasonable to assume that legislation would aggressively target the transportation emissions sector for requisite reductions. The amount of emissions reductions associated with State regulations that are ultimately credited toward BAAQMD's overall emission reduction goal may need to be revised in response to implementation of future legislation and programs identified in the Scoping Plan, as well as the application of AB 1493 and LCFS.

Threshold Development

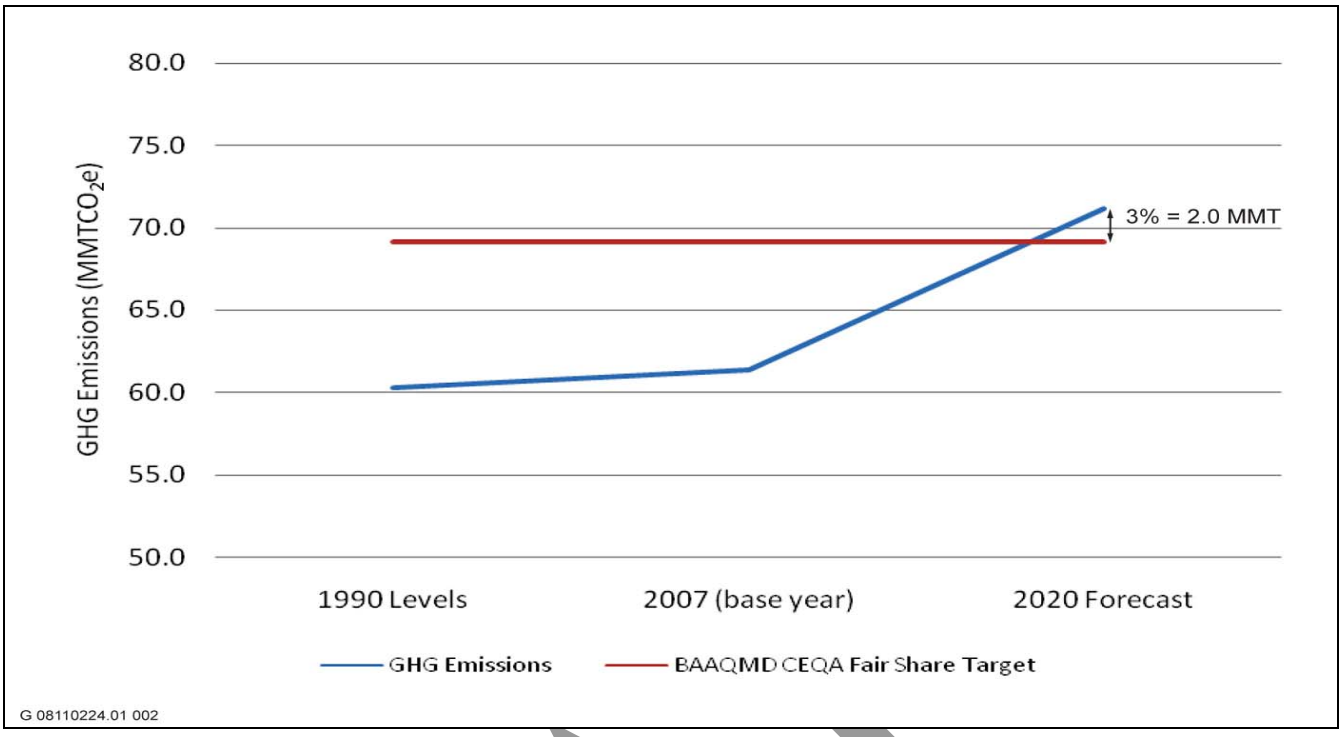
AB 32 mandates GHG reductions to 1990-equivalent levels by 2020, with foreseeable emission reductions from State regulations taken into account, were applied to the "land use-driven" emission sectors (i.e., those that are quantified for a project pursuant to a CEQA analysis [on-road passenger vehicles, commercial and residential natural gas, commercial and residential electricity consumption, and domestic waste water treatment], as directed by OPR in the Technical Advisory: *Climate Change and CEQA* [OPR 2008]). This translates to 2.8 percent reduction in GHG emissions from these sectors.

Applying a 2.8 percent reduction to these same emissions sectors in the SFBAAB's GHG emissions inventory would result in an equivalent fair share of 2.0 million metric tons per year (MMT/yr) reductions in GHG emissions from new land use development (refer to Figures 1 and 2).



Notes: AB = Assembly Bill, GHG = greenhouse gas, MMTCO2e = million metric tons carbon dioxide equivalent.
Sources: Data compiled by EDAW 2009, ARB 2009a.

California Land Use-Related Greenhouse Gas Emissions **Figure 1**



Notes: BAAQMD = Bay Area Air Quality Management District; CEQA = California Environmental Quality Act; GHG = greenhouse gas, MMTCO2e = million metric tons carbon dioxide equivalent.
Sources: Data compiled by EDAW 2009, BAAQMD 2008.

San Francisco Bay Area Air Basin Land Use-Related Greenhouse Gas Emissions **Figure 2**

A projected development inventory for the next ten years in the SFBAAB was calculated in the same manner as described above under the *Operational-Related Criteria Air Pollutants and Precursors* section (Page 15). Please refer to Exhibit 1. CO_2e emissions were modeled for projected development in the SFBAAB and compiled to estimate the associated GHG emissions inventory. The GHG (i.e., CO_2e) CEQA threshold level was adjusted for projected land use development that would occur within BAAQMD's jurisdiction over the period from 2010 through 2020.

Option 1A: Numeric-Only Threshold (Bright Line)

Option 1A involves using a numeric mass emissions significance threshold. If project-generated GHG emissions would be greater than the mass emission level, the impact would be significant and mitigation would be required. If project-generated emissions were below the mass emission level, no CEQA related mitigation measures would be required. This option is consistent with significance thresholds recommended by air districts throughout the State for criteria pollutants. Establishing a "bright line" to determine the significance of a project's GHG emission impact provides a level of certainty to lead agencies in determining if a project needs to reduce its GHG emissions through mitigation measures and when an EIR is required.

The Sensitivity Analysis (Table 14) conducted for Option 1 demonstrates various mass emission threshold levels (i.e., bright lines) that could be chosen based on the mitigation effectiveness anticipated to be achieved per project to meet the aggregate emission reductions of 2.0 MMT needed in the SFBAAB by 2020. Choosing a mass emission threshold level from Option 1 would result in about 60 percent of all projects and 90 percent of all GHG emissions anticipated to occur between now and 2020 from new land use development being above the significance threshold and having to implement all feasible mitigation measures to meet their CEQA obligations. This sensitivity analysis assumes the scenarios under Option 1A will achieve mitigation effectiveness on average of between 25 and 35 percent.

Project applicants and lead agencies could use readily available computer models to estimate a project's GHG emissions, based on project specific attributes, to determine if they are above or below the bright line numeric threshold. If they are above the threshold, they would then identify mitigation measures that they could implement to get below the bright line numeric significance threshold. This process would be a more straightforward analytical process than the other options discussed below.

Option 1B: Performance Standards-Only Threshold

Option 1B involves implementation of performance standards by all projects subject to CEQA that are not categorically or statutorily exempt that would achieve a minimum 24 percent emission reduction from all projects. If the project would implement performance measures to achieve a minimum 24 percent reduction in GHG emissions, the impact would be considered less than significant. The rationale for this approach is based on our analysis of the OPR identified land use-driven GHG emission inventory sectors in ARB's statewide GHG emission inventory that identified the total amount of emission reductions needed statewide to meet AB32 goals. This approach would also not give any "credit" to a project for statewide AB 32 emission reductions anticipated through implementation of the Scoping Plan for land use-driven sectors as these measures would be considered in the business as usual or baseline calculations for the project.

The sensitivity analysis (Table 14) indicates, at least theoretically, that requiring all projects to achieve a 24 percent emission reduction would result in the SFBAAB meeting its fair share of the emission reductions needed to meet the statewide 2020 GHG emission reduction goal. However, it should be noted that all projects (100 percent) subject to CEQA would have to calculate their unmitigated GHG emissions, or baseline, and then identify mitigation measures to reduce 24 percent of those emissions. It could prove very difficult for the smallest of projects to implement sufficient mitigation measures to reduce their GHG emissions by 24 percent, thereby requiring these smaller projects to prepare an EIR for no other impacts than GHG emissions and climate change.

Option 1B would require a substantial amount of guidance to project applicants and lead agencies on how to calculate a project's unmitigated baseline GHG emissions and the amount of emission reductions that could be taken credit for with each separate mitigation measure proposed for implementation.

Option 1C: Combination of Performance Standards and Numeric Threshold

Option 1C involves using a combination of a numeric mass emissions threshold and minimum performance standards for all projects that would result in emissions below the numeric threshold. If project-generated emissions would be over the numeric threshold level, the impact would be significant and mitigation would be required. A mitigation effectiveness range of between 25 and 35 percent was considered feasible. All projects that would result in GHG emissions less than the numeric threshold would be required to reduce emissions by a minimum of 5 percent to be considered less than significant.

The results of the sensitivity analysis presented in Table 14 for Option 1C suggest that a mass emission CEQA threshold of <2,175 MT/yr (equivalent to approximately120 single family dwelling units) combined with a moderately aggressive mitigation effectiveness of 30 percent on average from all projects above this mass amount would be needed to achieve the requisite emissions capture to reach 2.0 MMT CO_2e of GHG emissions reduction by 2020. A higher CEQA emission threshold of 3,000 MT/yr (equivalent to approximately 160 single family dwelling units) combined with a 30 percent mitigation effectiveness would not achieve 2.0 MMT CO_2e emission reductions by 2020. In addition, the sensitivity analysis for this option assumed a standard mitigation requirement through implementation of a prescribed set of performance standards of 5 percent emissions reduction for all projects that were below the numeric threshold. This was done to ensure that most projects would have to implement some amount of mitigation rather than placing the burden only on projects that exceeded the threshold. Because most projects would contribute some amount of GHG emissions, which have cumulative impacts, it is reasonable to expect that every project could achieve some amount of emission reduction. The 5 percent mitigation requirement was built into the threshold analysis, which was designed to achieve a reduction of 2.0

MMT CO_2e by 2020. The amount of 5 percent was chosen because it is our experience that it is relatively easy to achieve 5 percent reduction in operational GHG emissions through implementation of relatively few performance measures. For example, this amount would be achievable for projects located along transit or bicycle infrastructure. Sources of information cited in the report by the California Air Pollution Control Officers Association (CAPCOA) entitled CEQA and Climate Change indicate that there are measures and methods for quantification of mitigation effectiveness that can achieve the minimum 5 percent reduction in GHG emissions (CAPCOA 2008).

Based on our experience with developing mitigation measures for GHG emissions of this nature, a moderately aggressive performance standard for feasible mitigation at the project level is approximately 25-35 percent from today's GHG emission levels. The remainder of BAAQMD's 2.0 MMT CO_2e reduction goal, derived above, may be achieved through additional reductions expected from implementation of the AB 32 Scoping Plan. As additional regulations and legislation aimed at reducing GHG emissions from land use-related sectors become available in the future, the 2.0 MMT GHG emissions reduction goal may be revisited and recalculated by BAAQMD.

2.3.3.4 OPTION 2: CALIFORNIA AIR RESOURCES BOARD APPROACH

This option would involve implementation of the CEQA threshold(s) that are currently being developed by ARB in coordination with OPR, in response to SB 97 requirements.

Basis and Analysis

Pursuant to SB 97, OPR was directed to develop CEQA mitigation guidelines for GHG emissions. OPR looked to ARB for technical expertise in the development, and evidence in support, of these thresholds. ARB released its draft interim CEQA thresholds concepts for industrial, commercial, and residential projects for public comment in October 2008. The threshold concepts include:

- If the project is statutorily or categorically exempt from CEQA, it would be considered to result in a less-than-significant impact for GHG emissions.
- If the project is consistent with an ARB-approved SCS developed pursuant to SB 375, it would be considered to result in a less-than-significant impact for GHG emissions.
- For industrial projects (i.e., projects that would apply for air district permits), if the project would implement prescriptive performance standards related to construction and mobile-source operational GHG emissions, and meet a mass emissions threshold of 7,000 MT CO_2e/yr, it would be considered to result in a less-than-significant impact for GHG emissions.
- For residential and commercial projects, if the project would implement a series of prescriptive performance measures addressing GHG emissions from construction, mobile sources, energy consumption, water consumption, and solid waste, and potentially meet a mass emissions threshold; which is still under development and was not provided in the interim threshold draft; it would be considered to result in a less-than-significant impact for GHG emissions.

As of the time of writing, ARB is still accepting public comments on these draft options, and has not suggested a timeline for revision or adoption (ARB 2009b).

Table 14
Greenhouse Gas Threshold Level Sensitivity Analysis

Option	Mitigation Effectiveness Assumptions		Mass Emission Threshold Level (MT CO_2e/yr)	% of Projects Captured	% of Emissions Captured	Emissions Reduction per year (MT/yr)	Aggregate Emissions Reduction (MMT) at 2020	Threshold Project Size Equivalent (single family dwelling units)
	Performance Standards Applied to All Projects with Emissions < Threshold Level	Mitigation Effectiveness Applied to Emissions > Threshold Level						
1A	N/A	35%	1,175	58%	92%	202,729	2.0	65
1A	N/A	30%	1,150	59%	92%	200,091	2.0	64
1A	N/A	25%	1,075	59%	92%	200,752	2.0	60
1A	N/A	35%	1,945	14%	61%	189,516	1.9	107
1A	N/A	30%	1,195	58%	92%	190,141	1.9	66
1A	N/A	25%	1,120	59%	92%	190,602	1.9	62
1A	N/A	35%	2,175	14%	60%	180,256	1.8	120
1A	N/A	30%	1,350	21%	67%	180,491	1.8	75
1A	N/A	25%	1,500	20%	67%	179,535	1.8	83
1A	N/A	35%	2,875	10%	56%	170,452	1.7	159
1A	N/A	30%	2,000	14%	61%	170,363	1.7	111
1A	N/A	25%	2,250	14%	60%	170,636	1.7	125
1A	N/A	35%	3,175	10%	55%	160,295	1.6	176
1A	N/A	30%	2,900	10%	56%	159,686	1.6	161
1A	N/A	25%	2,825	11%	57%	159,614	1.6	156
1B	24%	N/A	N/A	100%	100%	192,544	1.9	N/A[2]
1C	5%	35%	2,475	14%	60%	200,316	2.0	135
1C	5%	30%	2,175	14%	60%	200,368	2.0	120
1C	5%	25%	1,725	17%	63%	204,398	2.0	95
1C	5%	30%	3,000	10%	56%	174,019	1.7	160
1C	5%	30%	10,000	2%	33%	209,682	1.2	550

Notes: MMT = million metric tons per year; MT CO_2e/yr = metric tons of carbon dioxide equivalent emissions per year; MT/yr = metric tons per year; N/A = not applicable.
[1] Please refer to Table 9 for assumptions regarding regulatory emission reductions.
[2] Any project subject to CEQA would trigger this threshold.
Please refer to Appendix E for detailed calculations.
Source: Data modeled by EDAW 2009.

2.3.4 TOXIC AIR CONTAMINANT IMPACTS

2.3.4.1 CURRENT APPROACH

Any project with the potential to expose sensitive receptors (including residential areas) or the general public to substantial levels of TAC would be deemed to have a significant impact. This applies to new sensitive receptors locating near existing sources of TACs, as well as sources of TAC locating near existing receptors. The current TAC threshold of significance applies to all projects, regardless of size, and requires mitigation for TAC impacts above the thresholds listed below.

Proposed development projects that have the potential to expose sensitive receptors or the general public to TAC in excess of the following thresholds from any source, mobile or stationary would be considered to have a significant air quality impact if the:

- Probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in one million.
- Ground-level concentrations of non-carcinogenic toxic air contaminants would result in a Hazard Index greater than 1 for the MEI.

Accidental Releases/Acutely Hazardous Air Emissions

The BAAQMD currently recommends, at a minimum, that the lead agency, in consultation with the administering agency of the Risk Management Prevention Program (RMPP), find that any project resulting in receptors being within the Emergency Response Planning Guidelines (ERPG) exposure level 2 for a facility has a significant air quality impact. ERPG exposure level 2 is defined as "the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action."

The current Accidental Release/Hazardous Air Emissions threshold of significance could affect all projects, regardless of size, and require mitigation for Accidental Release/Hazardous Air Emissions impacts.

2.3.5 OPERATIONAL-RELATED

2.3.5.1 SITING A NEW SOURCE OF TACS

Option 1: Stationary Source Permit Approach

This option would consist of applying the current stationary source permitting thresholds to project-generated stationary, area-, and mobile-source TAC emissions.

Basis and Analysis

Stationary sources of emissions are subject to BAAQMD's permit process per adopted rules and regulations. The permitting process requires that all new or modified stationary sources that emit TACs perform modeling to determine what the concentration of TACs will be at the boundary of their property. This current permitting approach does not include area or mobile sources of emissions in the modeling or permitting assessment. If a proposed stationary source will have operational TAC concentrations from permitted equipment that result in an estimated 1 excess cancer risk in a million, the project is required to install Toxic Best Available Control Technology (TBACT) to minimize emissions of TACs. The TAC modeling must also demonstrate to BAAQMD that implementation of the proposed project would not result in additional incremental exposure of surrounding receptors to levels that exceed 10 in one million for excess cancer risk or a hazard index above one.

The Option 1 approach would expand on the current approach by requiring the application of the one in a million requirement for stationary sources to install TBACT to projects that have TAC emissions from sources (primarily mobile) not currently required to obtain permits to operate. These non-stationary source type projects would be required to implement Toxic Best Practices (TBP) if their modeled cancer risks are above the one in a million threshold. The BAAQMD would identify a list of TBPs for non-stationary sources to implement if they are above the one in a million threshold. The threshold of significant impact, thereby requiring implementation of all feasible onsite mitigation measures would remain at the current 10 in a million excess cancer risk. Stationary source permits to operate would still not be issued to stationary sources that could not reduce their risk on site below the 10 in a million excess cancer risk threshold.

Option 2: Tiered Approach

This approach would involve application of a tiered (more stringent) CEQA threshold in areas of high concern, while the current 10 in one million threshold would be applied in all other areas.

Basis and Analysis

BAAQMD's Community Air Risk Evaluation (CARE) Program examines TAC emissions from stationary sources, area sources, and on-road and off-road mobile sources. Phase 1 of the CARE Program involved developing a TAC emissions inventory and conducting computer modeling to identify areas in the SFBAAB that are cumulatively impacted from sources of TACs. Demographic data was then used to identify communities of individuals that are disproportionally impacted from high concentrations of TACs. According to the findings of Phase 1 of the CARE Program, diesel PM accounts for about 80 percent of the inhalation cancer risk from TACs in the SFBAAB. The highest diesel PM emissions occur in the urban core areas of Concord, eastern San Francisco, western Alameda County, Redwood City/East Palo Alto, Richmond/San Pablo, and San Jose (BAAQMD 2006).

Option 2 would apply a more restrictive significance threshold of 5 in one million for excess cancer risk and require the installation of TBACT and TBP for any source with TACs locating in a CARE community. These thresholds would apply to stationary, area, and mobile sources of TAC emissions. Please refer to Figures 3 and 4 for CARE program priority community locations.

Option 3: No Net Increase Approach

Option 3 is identical to Option 2 except that it would proposes a no net increase inhalation cancer risk CEQA significance threshold for siting a new source of TACs in CARE priority communities identified as the urban core areas of Concord, eastern San Francisco, western Alameda County, Redwood City/East Palo Alto, Richmond/San Pablo, and San Jose. This threshold would not define a "substantial change" (see definition of significant impact in section below), because all changes would be considered significant. The practical implications of essentially setting a zero threshold for TACs in these communities could be substantial. A no net increase or zero threshold could make it extremely difficult for a wide variety of businesses to locate in the CARE communities, businesses that are essential to daily lives. A large number of relatively small projects would need to prepare an EIR since any increase in TACs would be considered a significant impact. There are not adequate mitigation strategies or alternatives available to eliminate all TAC from even the smallest of sources.

2.3.5.2 SITING A NEW RECEPTOR

Impacts of the Existing Environment on a Proposed Project

In addressing the potential for impacts from existing sources of toxic exposure, Lead Agencies should take care to focus their analyses squarely on impacts arising from *changes* to the environment caused by the proposed project. (*See* CEQA § 21068, defining "significant effect on the environment" as "a substantial, or potentially substantial, adverse *change* in the environment" (emphasis added).) A Lead Agency can address a preexisting environmental

condition—such as existing sources of toxics—under CEQA only if there is a nexus between the preexisting condition and some physical change arising from the project. For example, the mere existence of preexisting groundwater contamination underneath a property does not constitute a significant environmental impact from a project on the property that would not affect the contamination in any way, as the California Court of Appeal held in the case of *Baird v. County of Contra Costa* (1995) 32 Cal.App.4th 1464, 1468. But where a change caused by the project will implicate the preexisting contamination in some way, such as introducing people to an area with a preexisting hazard, the contamination does warrant consideration under CEQA. Thus, where a developer seeks to acquire contaminated property and the acquisition will require it to manage the contaminated soil, the preexisting contamination is subject to CEQA analysis, as the Court of Appeal held in *McQueen v. Mid-Peninsula Regional Open Space District* (1988) 202 Cal.App.3d 1136, 1147, 249 Cal. Rptr. 439. In that case the project did entail a change implicating the preexisting contamination, which is the key distinction the court pointed to in *Baird*. (*See also City of Santa Monica v. City of Los Angeles*, 2007 Cal. App. Unpub. LEXIS 7409, *87–*89 n.22 (distinguishing *Baird* in noting that constructing buildings above subterranean methane contamination could concentrate the methane and constitute a physical change triggering CEQA analysis of the methane impacts).)

Lead agencies should, therefore, ensure that they focus on physical changes caused by the project that will implicate existing sources of toxic exposure. An example of such a change caused by the project would be if the project causes additional people to be attracted to the project location and thereby to be exposed to additional toxic risks. This approach to evaluating risks to new occupants of a project from existing sources of risk has been endorsed by the Resources Agency in Section 15126.2(a) of the CEQA Guidelines. Lead agencies using such an approach should specifically identify the changes being caused by the project in relation to existing sources of risk to minimize the chances of falling afoul of *Baird*.

Option 1: Statistical/Percentile Health Impact-Based Approach

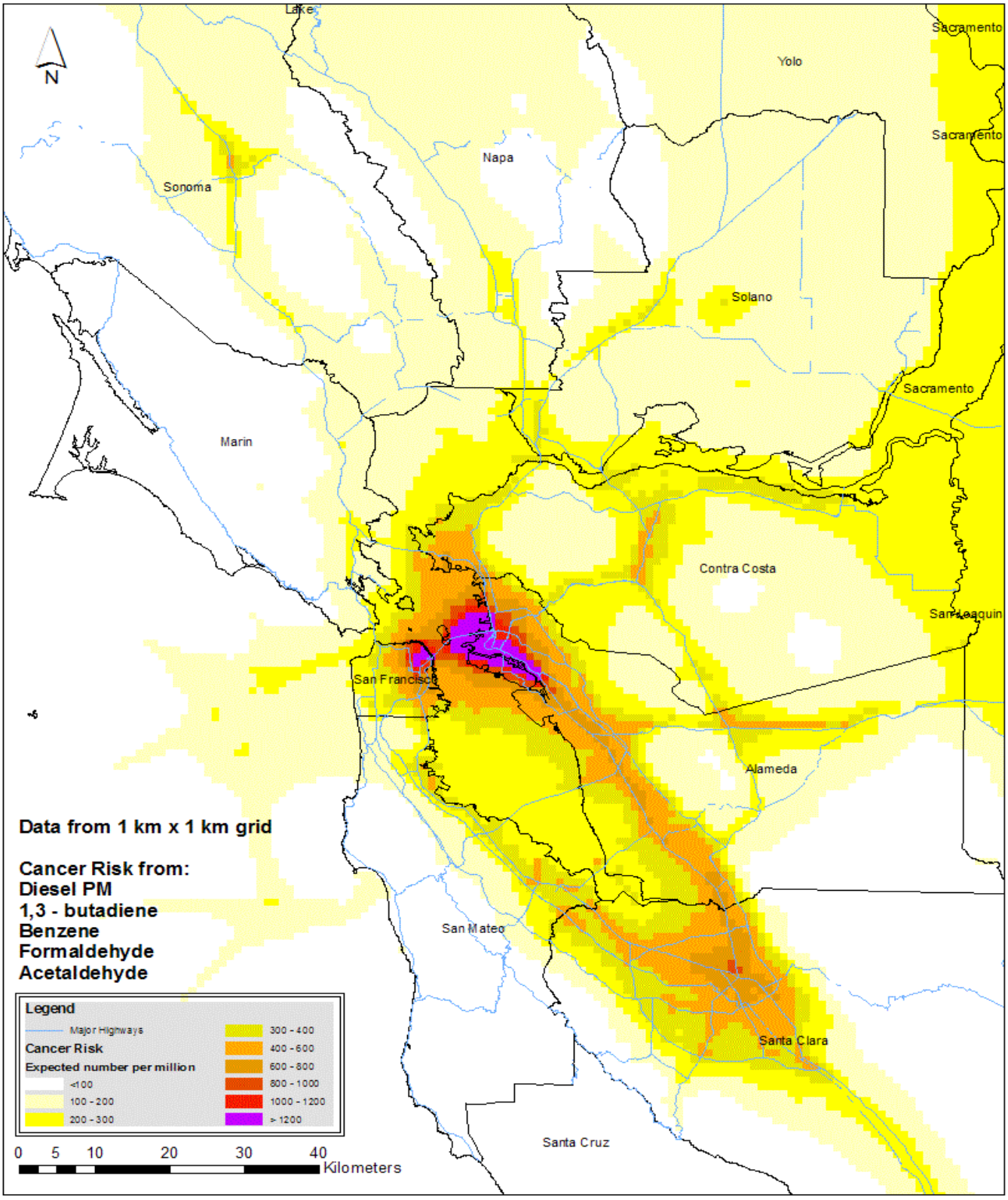
This approach considers a method of determining whether a project would result in a significant impact if it would attract or locate new sensitive receptors into an area exposed to TAC concentrations exceeding the ambient median exposure for the entire SFBAAB.

Basis and Analysis

According to BAAQMD's CARE program's one kilometer resolution grid point data, 50 percent of the land area in the SFBAAB currently experiences background inhalation cancer risk levels of less than 152 excess cases per one million, with a standard deviation of 180. The frequency distribution of unweighted (i.e., does not include population) inhalation cancer risk in the SFBAAB is presented in Figure 5, and detailed in Appendix E.

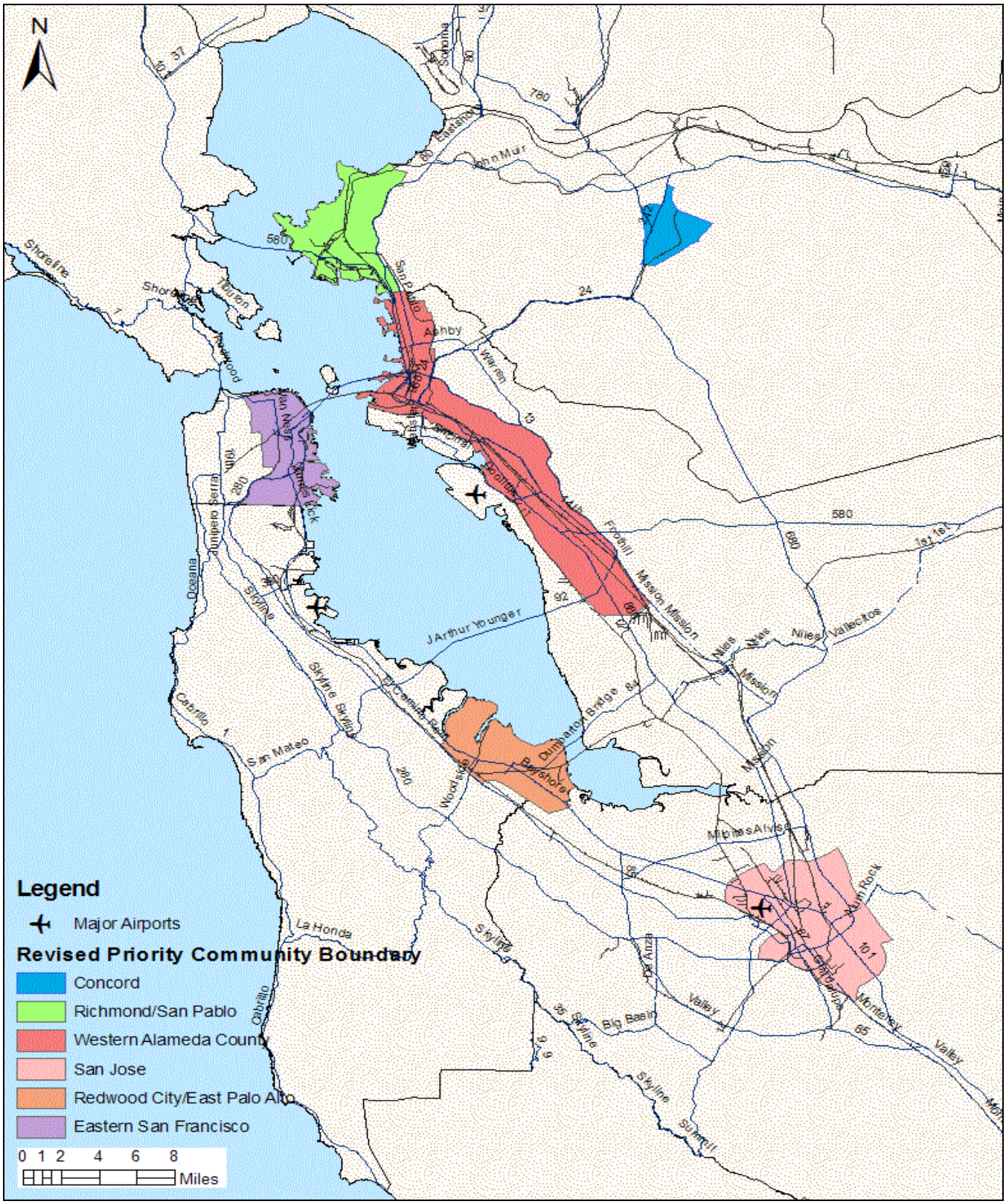
Based on the Phase I findings from the CARE Program, majority of the cancer risks in the SFBAAB are along major freeways. Diesel PM from on-road and off-road mobile sources are the greatest single contributor (over 80 percent) of the TAC cancer risk in the SFBAAB. Cancer risks in areas along these major freeways are estimated to range from 200 to over 500 excess cases in a million. Typical annual average ambient levels of diesel PM in the SFBAAB are approximately 1.3 micrograms per cubic meter ($\mu g/m^3$), which equates to approximately 300 excess cancer cases in a million.

By weighing the cancer risk by the number of sensitive receptors (i.e., people under the age of 18 and over the age of 64) living in each grid cell, BAAQMD is able to identify areas of high potential risk exposure. This analysis weights risk by the population of each grid point. Fifty percent of BAAQMD's population is estimated to have an ambient background inhalation cancer risk of less than 500 cases in one million. Approximately two percent of the SFBAAB population is exposed to background risk levels of less than 200 excess cases in one million. This is in contrast to the upper percentile ranges where 8 percent of the SFBAAB population is exposed to background risk levels of greater than 1,000 excess cases per one million. Please refer to Figure 6 for a graphical representation of population-weighted risk data, and refer to Table 15 for a summary of population-weighted inhalation cancer risk percentile data.



Notes: PM = particulate matter.
Source: BAAQMD 2008.

Modeled Inhalation Cancer Risk in the San Francisco Bay Area Air Basin **Figure 3**

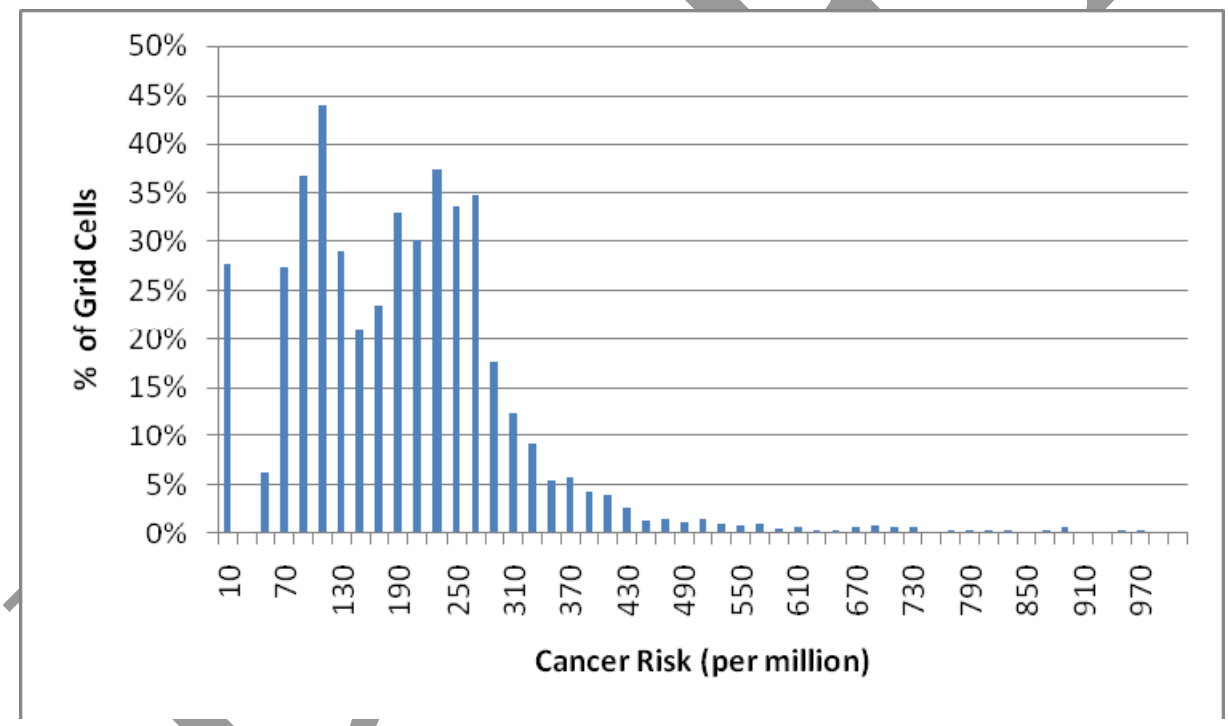


Source: BAAQMD 2008.

Priority Community Areas **Figure 4**

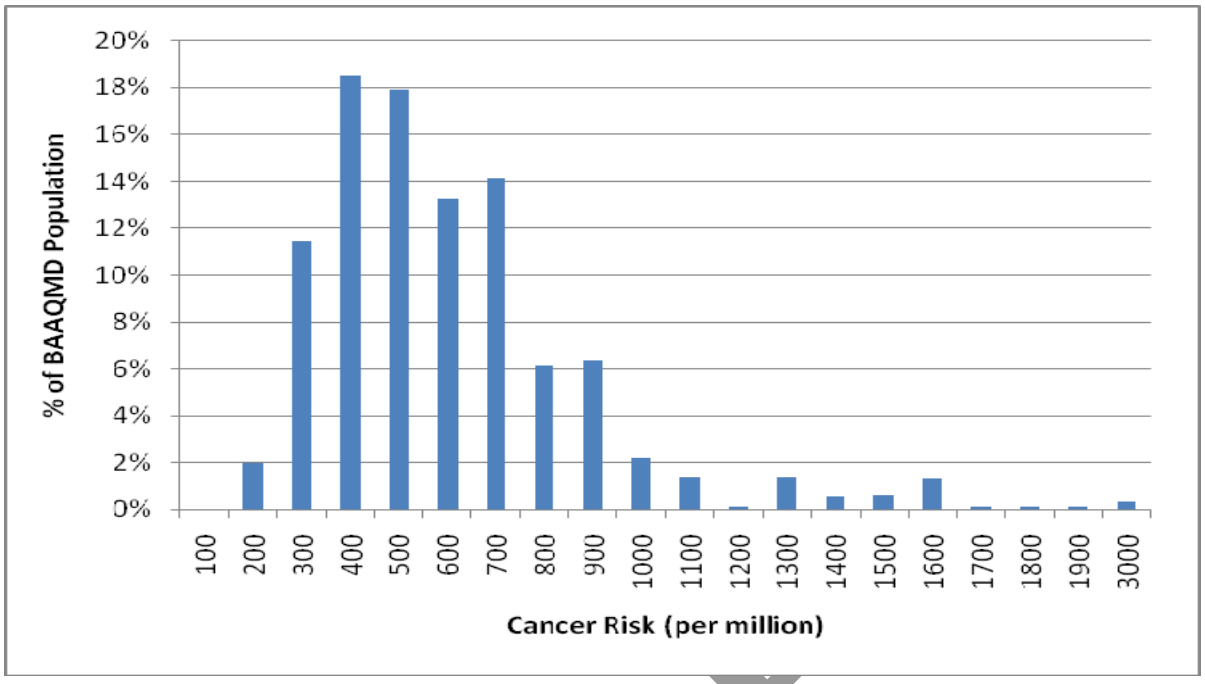
Option 1 for siting new sensitive receptors in areas currently impacted from nearby sources of TACs would set a significance threshold at the cleanest areas in the Bay Area, with an exposure to inhalation cancer risk occurring now in the SFBAAB, of 500 excess cancer cases in a million. This option would attempt to reconcile the issues associated with promoting high density infill transit oriented development, while, at the same time, trying to reduce the public's exposure to TACs. Many of the features that make transit oriented development favorable from a regional air quality perspective (e.g., being located along existing transportation, transit, and train corridors) can also expose sensitive receptors to high concentrations of TACs. At some point the benefits to regional air quality from development in these areas are superseded by the need to protect the public from moving into an area of high TACs.

Further complicating this issue is ARB's diesel risk reduction plan, which estimates an 85 percent reduction in statewide diesel particulate matter (PM) emissions by 2020, and whether currently existing areas of high cancer risks from diesel PM will be at acceptable levels in 2020 due to implementation thereof. Since CEQA is concerned about the existing condition at the time the Notice of Preparation is prepared, BAAQMD staff believe it would be a mistake to assume ARB's plan would ensure significant impacts did not occur. This threshold would need to be revisited after ARB's diesel risk reduction plan has been implemented.



Source: BAAQMD 2009.

San Francisco Bay Area Air Basin Unweighted Inhalation Cancer Risk **Figure 5**



Notes: BAAQMD = Bay Area Air Quality Management District.
Sources: EDAW 2009, BAAQMD 2009.

San Francisco Bay Area Air Basin Population-Weighted Inhalation Cancer Risk Figure 6

Table 15
Statistical Summary of Population-Weighted Background Risk

Portion of Population (Percent of population below level of background risk)	Background Risk (inhalation cancer cases in one million)
92	1,000
90	900
83	800
77	700
63	600
50	500
32	400
13	300
2	200
0	100

Source: Data compiled by EDAW 2009.
See Appendix G for detailed calculations.

2.4 ODORS IMPACTS

2.4.1.1 CURRENT APPROACH

The BAAQMD considers a project locating near an existing source of odors as having a significant odor impact if it is proposed for a site that is closer to an existing odor source than any location where there has been:

- More than one confirmed complaint per year averaged over a three year period; or
- Three unconfirmed complaints per year averaged over a three year period.

If the proposed project is located farther than the screening distance for the source of the odors identified in Table 16, the odor impacts are considered less than significant.

If a proposed project is determined to result in potential odor problems as defined by the criteria in District Regulation 7: Odorous Substances, and sensitive receptors are located closer than the screening distance in Table 16, the BAAQMD recommends that mitigation measures should be identified to reduce a potentially significant impact.

Table 16
BAAQMD Project Screening Trigger Levels for Potential Odor Sources

Type of Operation Project Screening	Distance
Wastewater Treatment Plant	1 mile
Sanitary Landfill	1 mile
Transfer Station	1 mile
Composting Facility	1 mile
Petroleum Refinery	2 miles
Asphalt Batch Plant	1 mile
Chemical Manufacturing	1 mile
Fiberglass Manufacturing	1 mile
Painting/Coating Operations (e.g. auto body shops)	1 mile
Rendering Plant	1 mile
Coffee Roaster	1 mile

Notes: BAAQMD = Bay Area Air Quality Management District.
Source: BAAQMD 1999.

The odor threshold of significance could affect all projects, regardless of size, and require mitigation for odor impacts.

2.4.2 SITING A NEW RECEPTOR OR SOURCE

Odors are generally considered a nuisance, but can result in a public health concern. Some land uses that are needed to provide services to the population of an area can result in offensive odors, such as filling portable propane tanks or recycling center operations. When a proposed project includes the siting of sensitive receptors in proximity to an existing odor source, or when siting a new source of potential odors, the following qualitative evaluation should be performed.

2.4.2.1 OPTION 1: QUALITATIVE APPROACH

When determining whether potential for odor impacts exists, consider the following factors and make a determination based on evidence in each qualitative analysis category:

- **Distance:** Use the screening-level distances in Table 16.

- **Wind Direction:** Consider whether sensitive receptors are located upwind or downwind from the source for the most of the year. If odor occurrences associated with the source are seasonal in nature, consider whether sensitive receptors are located downwind during the season in which odor emissions occur.

- **Complaint History:** Consider whether there is a history of complaints associated with the source. If there is no complaint history associated with a particular source (perhaps because sensitive receptors do not already exist in proximity to the source), consider complaint-history associated with other similar sources in BAAQMD's jurisdiction with potential to emit the same or similar types of odorous chemicals or compounds, or that accommodate similar types of processes.

- **Character of Source:** Consider the character of the odor source, for example, the type of odor events according to duration of exposure or averaging time (e.g., continuous release, frequent release events, or infrequent events).

- **Exposure:** Consider whether the project would result in the exposure of a substantial number of people to odorous emissions.

2.5 PLAN-LEVEL IMPACT THRESHOLDS

2.5.1 CURRENT THRESHOLD APPROACH

General Plans of cities and counties must show consistency with regional plans and policies affecting air quality to claim a less than significant impact on air quality. General plan amendments, redevelopment plans, specific area plans, annexations of lands and services, and similar planning activities should receive the same scrutiny as general plans with respect to consistency with regional air quality plans. For a proposed local plan to be consistent with the regional air quality plan it must be consistent with the most recently adopted AQP, which are updated approximately every three years.

All of the following criteria must be satisfied for a proposed plan to be determined to be consistent with the AQP, and therefore, result in a less than significant impact on air quality.

2.5.1.1 DETERMINING LOCAL PLAN CONSISTENCY

Proposed Plans must show over the planning period of the plan that:

- Population growth for the jurisdiction will not exceed the values included in the current AQP, and
- The rate of increase in VMT for the jurisdiction is equal to or lower than the rate of increase in population.

2.5.1.2 DETERMINING LOCAL PLAN CONSISTENCY WITH CLEAN AIR PLAN TRANSPORTATION CONTROL MEASURES

Determining consistency of local plans with the AQP also involves assessing whether AQP transportation control measures (TCMs) for which local governments are implementing agencies are indeed being implemented. The AQP identifies implementing agencies/entities for each of the TCMs included in the AQP. Local plans that do not demonstrate reasonable efforts to implement TCMs in the AQP would be considered to be inconsistent with the regional air quality plan and therefore have a significant air quality impact.

2.5.1.3 LOCAL PLAN IMPACTS ASSOCIATED WITH TOXIC AIR CONTAMINANT AND ODORS

For local plans to have a less-than-significant impact with respect to potential TACs and odors, buffer zones would have to be established around existing and proposed land uses that would emit these air pollutants. Buffer

zones to avoid odors and toxics impacts should be reflected in local plan policies, land use map(s), and implementing ordinances (e.g., zoning ordinance).

The threshold of significance for plan impacts could affect all plan adoptions and amendments and require mitigation for a plan's air quality impacts.

OPTION 1: CURRENT PLUS GHG EFFICIENCY APPROACH

This approach maintains the current approach and adds a greenhouse gas component. Option 1 proposes the development of a GHG-efficiency metric (e.g., GHG emissions per unit) which would enable comparison of a proposed general plan to the current general plan and to determine if the proposed general plan meets AB 32 emission reduction goals.

BASIS AND ANALYSIS

AB 32 identifies local governments as essential partners in achieving California's goal to reduce GHG emissions. Local governments have primary authority to plan, zone, approve, and permit how and where land is developed to accommodate population growth and the changing needs of their jurisdiction. ARB has developed the Local Government Operations Protocol and is developing a protocol to estimate community-wide GHG emissions. ARB encourages local governments to use these protocols to track progress in reducing GHG emissions. ARB encourages local governments to institutionalize the community's strategy for reducing its carbon footprint in its general plan. SB 375 creates a process for regional integration of land development patterns and transportation infrastructure planning with the primary goal of reducing GHG emissions from the largest sector of the GHG emission inventory, light duty vehicles.

If a statewide context for GHG emissions reductions is established, GHG efficiency can be viewed independently from the jurisdiction in which the plan is located. Normalizing this projected 2020 mass of emissions from land use-related emissions sectors by a demographic unit related to what the general plan itself is accommodating (e.g., population and employment) provides consideration for GHG efficiency of a project and the opportunity to evaluate the project's consistency with AB 32 targets. For the purposes of this exercise, the sum of the number of jobs and the number of residents at a point in time is termed the "service population" (SP). GHG efficiency metrics were developed for the emissions rates at the State level that would accommodate projected growth (as indicated by population and employment growth) under trend forecast conditions, and the emission rates needed to accommodate growth while allowing for consistency with the goals of AB 32 (i.e., 1990 GHG emissions levels by 2020).

If a general plan demonstrates, through dividing the emissions inventory projections (MT CO_2e) by the amount of growth that would be accommodated in 2020, that it could meet the GHG efficiency metrics proposed in this section, (either 6.4 MT CO_2e/capita or 4.4 MT CO_2e/SP) BAAQMD believes that the amount of GHG emissions associated with the general plan would be less than significant, regardless of its size (and magnitude of GHG emissions). Please refer to Table 18. In other words, the general plan would accommodate growth in a manner that would not hinder the State's ability to achieve AB 32 goals, and thus, would be less than significant for GHG emissions and their contribution to climate change.

When analyzing long-range plans, such as general plans, it is important to note that the planning horizon will often surpass the 2020 timeframe for implementation of AB 32. Executive Order S-3-05 establishes a more aggressive emissions reduction goal for the year 2050 of 80 percent below 1990 emissions levels. The year 2020 should be viewed as a milestone year, and the general plan should not preclude the community from a trajectory toward the 2050 goal. However, the 2020 timeframe is examined in this threshold evaluation because doing so for the 2050 timeframe (with respect to population, employment, and GHG emissions projections) would be too speculative. Advances in technology and policy decisions at the state level will be needed to meet the aggressive 2050 goals. It is beyond the scope of the analysis tools available at this time to examine reasonable emissions

reductions that can be achieved through CEQA analysis in the year 2050. As the 2050 timeframe draws nearer, BAAQMD will need to reevaluate the threshold to better represent progress toward 2050 goals.

Table 17
California Greenhouse Gas Emissions, Population Projections, and Greenhouse Gas Efficiency Thresholds

	1990	2002-2004 Average	2020
Population	29,758,213	36,199,342	44,135,923
Employment	14,294,100	16,413,400	20,194,661
California Service Population (Population + Employment)	44,052,313	52,612,742	64,330,584
Projected GHG emissions(metric tons CO_2e)/capita[1]	9.42	8.36	8.35
Projected GHG emissions (metric tons CO_2e)/SP[1]	6.37	5.75	5.73
AB 32 Goal GHG emissions (metric tons CO_2e)/capita[1]	9.42	7.75	**6.35**
AB 32 Goal GHG emissions (metric tons CO_2e)/SP[1]	6.37	5.33	**4.36**

Notes: AB = Assembly Bill; CO_2e = carbon dioxide equivalent; GHG = greenhouse gas; SP = service population.
[1] Greenhouse gas efficiency levels were calculated using only the "land use-related" sectors of ARB's emissions inventory. Please refer to Appendix D for detailed calculations.
Sources: Data compiled by EDAW 2009, ARB 2009a, DOF 2009, EDD 2009.

Benefits of the Service Population metric are that it allows decision makers to compare GHG efficiency of general plan alternatives that vary residential and non-residential development totals, encourages GHG efficiency through improving jobs/housing balance, and treats all jurisdictions equitably, rather than giving preference to communities that accommodate more residential (population-driven) land uses than non-residential (employment driven) land uses. Another benefit of an efficiency-based metric is that it does not penalize well-planned communities that propose a large amount of development. Instead, GHG efficiency metrics act to encourage the types of development that BAAQMD and OPR support (i.e., infill and transit-oriented development), rather than discourage large developments for being accompanied by a large mass of GHG emissions. This type of threshold can shed light on a well-planned general plan that accommodates a large amount of growth in a GHG-efficient way.

2.5.1.4 OPTION 2: CURRENT APPROACH PLUS CLIMATE ACTION PLAN-FOCUSED APPROACH

This approach would also build on the current approach to evaluating the significance of proposed plans on local and regional air quality and GHG emissions. Local jurisdictions that may not initiate a general plan update for a number of years may decide to address GHG emissions in a stand-alone Climate Action Plan. Option 2 would require an analysis demonstrating that the CAP is consistent with all of the AB 32 Scoping Plan measures.

Basis and Analysis

The CAP should identify a land use design, transportation network, goals, policies and implementation measures that would achieve a 23.9 percent reduction in GHG emissions relative to 2020 emissions levels as discussed in the section above and calculated in Appendix C. As discussed previously, 23.9 percent was calculated relative to 2020 emissions projections from the "land use-related" GHG emissions sectors only (e.g., the sectors over which local government would have financial, operational, or discretionary control through land use entitlement authority; see Appendix C). The CAP should be adopted by resolution and include enforceable and specific policies and implementation programs demonstrating that those policies will achieve AB 32 goals.

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