4.1 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

Introduction

The Air Quality and Greenhouse Gas Emissions chapter of this Draft EIR describes the effects of the proposed project on local and regional air quality. The chapter includes a discussion of the existing air quality and greenhouse gas (GHG) setting, construction-related air quality impacts resulting from grading and equipment emissions, direct and indirect emissions associated with the project, the impacts of these emissions on both the local and regional scale, and mitigation measures warranted to reduce or eliminate any identified significant impacts. The chapter is primarily based on information and guidance within the Bay Area Air Quality Management District (BAAQMD) *California Environmental Quality Act Air Quality Guidelines* (CEQA Guidelines),[1] the *Pittsburg General Plan 2020*[2] and associated EIR,[3] the *Tuscany Meadows Community Health Risk Assessment* (Appendix D),[4] and the model results generated using California Emissions Estimator Model (CalEEMod) version 2013.2.2 (Appendix E). [5]

Existing Environmental Setting

The following setting information provides an overview of the existing air quality in the proposed project area, located in an unincorporated area of Contra Costa County, near the city limits of Pittsburg and Antioch.

Air Basin Characteristics

The project site is located in the eastern portion of the nine-county San Francisco Bay Area Air Basin (SFBAAB), and is within the jurisdictional boundaries of the BAAQMD. The SFBAAB consists of coastal mountain ranges, inland valleys, and bays. The proposed project is located on the south side of the San Joaquin River delta, east of the Carquinez Strait, and would be considered to be within the Carquinez Strait region of the SFBAAB. Being located between the greater Bay Area and the Central Valley has great influence on the climate and air quality of the area. During the summer and fall months, marine air is drawn eastward through the Carquinez Strait, with common wind speeds of 15 to 20 miles per hour throughout the region. The general west-to-east flow of the winds in the straits tends to move pollutants east. Thus, the winds dilute pollutants and transport them away from the area, so that emissions released in the project area have more influence on air quality in the Sacramento and San Joaquin Valleys than locally. However, stationary sources located in upwind cities could influence the local air quality.

Average daily maximum temperatures (in degrees Fahrenheit) are in the mid to high 50s in the winter and the high 80s in the summer. Average minimum temperatures are in the high 30s to low 40s in the winter and the mid-50s in the summer. Rainfall amounts in the region vary from 13 inches annually in Antioch to 22 inches annually in Fairfield.

Ambient Air Quality Standards

Both the U.S. Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) have established Ambient Air Quality Standards (AAQS) for common pollutants. The federal standards are divided into primary standards, which are designed to protect the public health, and secondary standards, which are designed to protect the public welfare. The AAQS for each contaminant represent safe levels that avoid specific adverse health effects. Pollutants for which AAQS have been established are called "criteria" pollutants. Table 4.1-1 identifies the major pollutants, characteristics, health effects and typical sources. The federal and California AAQS are summarized in Table 4.1-2. The federal and State AAQS were developed independently with differing purposes and methods. As a result, the federal and State standards differ in some cases. In general, the State of California standards are more stringent, particularly for ozone and particulate matter (PM_{10} and $PM_{2.5}$), than the federal standards.

Ozone

Ozone is the most prevalent of a class of photochemical oxidants formed in the urban atmosphere. The creation of ozone is a result of a complex chemical reaction between reactive organic gases (ROG) and NO_X gases in the presence of sunshine. Unlike other pollutants, ozone is not released directly into the atmosphere from any sources. Factories, automobiles, and evaporation of solvents and fuels are the major sources of ozone precursors. The health effects of ozone are difficulty breathing, lung tissue damage, and eye irritation.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless, poisonous gas produced by incomplete burning of carbon-based fuels such as gasoline, oil, and wood. When CO enters the body, the CO combines with chemicals in the body, which prevents blood from carrying oxygen to cells, tissues, and organs. Symptoms of exposure to CO can include problems with vision, reduced alertness, and general reduction in mental and physical functions. Exposure to CO can result in chest pain, headaches, reduced mental alertness, and death at high concentrations.

Nitrogen Oxide Gases

Nitrogen oxides gases (NO_X) are produced from burning fuels, including gasoline and coal. Nitrogen oxides react with ROG (found in paints and solvents) to form ozone, which can harm health, damage the environment, and cause poor visibility. Additionally, NO_X emissions are a major component of acid rain. Health effects related to NO_X include lung irritation and lung damage.

Sulfates

Sulfates (SO_X) are colorless gases and constitute a major element of pollution in the atmosphere. SO_X is commonly produced by fossil fuel combustion. In the atmosphere, SO_X is usually oxidized by ozone and hydrogen peroxide to form sulfur dioxide and trioxide.

Table 4.1-1
Major Criteria Pollutants

Pollutant	Characteristics	Health Effects	Examples of Sources
Ozone	A strong smelling, pale blue, reactive toxic chemical gas consisting of three oxygen atoms. Ozone exists in the upper atmosphere ozone layer (stratospheric ozone) as well as at the Earth's surface in the troposphere (ground-level ozone). Ozone in the troposphere causes numerous adverse health effects, is a criteria air pollutant, and is a major component of smog.	• Breathing difficulties • Lung tissue damage • Damage to rubber and some plastics • Eye and skin irritation	Formed when reactive organic gases (ROG) and nitrogen oxide gases (NO_X) react in the presence of sunlight. ROG and NO_X sources include any source that burns fuels (e.g., gasoline, natural gas, wood, oil), solvents, petroleum processing and storage, and pesticides.
Carbon Monoxide	A colorless, odorless gas resulting from the incomplete combustion of hydrocarbon fuels. Over 80 percent of the carbon monoxide emitted in urban areas is contributed by motor vehicles.	• Chest pain in heart patients • Headaches and nausea • Reduced mental alertness • High concentration can result in death	Any source that burns fuel such as automobiles, trucks, heavy construction equipment, farming equipment and residential heating.
Nitrogen Dioxide	Nitrogen dioxide is typically created during combustion processes, and is a major contributor to smog formation and acid deposition.	• Lung irritation and damage • Reacts in the atmosphere to form ozone and acid rain	Any source that burns fuel such as automobiles, trucks, heavy construction equipment, farming equipment and residential heating.
Sulfur Dioxide	A strong smelling, colorless gas that is formed by the combustion of fossil fuels.	• Increased lung disease and breathing problems for asthmatics • Reacts in the atmosphere to form acid rain	Coal or oil burning power plants and industries, refineries, and diesel engines.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Any material, except pure water, that exists in the solid or liquid state in the atmosphere. The size of particulate matter can vary from coarse, wind-blown dust particles to fine particle combustion products.	• Increased respiratory disease • Lung damage • Premature death • Reduced visibility	Fuel combustion in motor vehicles, equipment and industrial sources, residential and agricultural burning. Particulate matter is also formed from reaction of other pollutants (acid rain, NO_X, SO_X, organics).

Source: California Air Resources Board, http://www.arb.ca.gov/html/gloss.htm, accessed October 2013.[6]

Table 4.1-2
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary	Secondary
Ozone	1 Hour	0.09 ppm	-	Same as primary
	8 Hour	0.07 ppm	0.075 ppm	
Carbon Monoxide	8 Hour	9 ppm	9 ppm	-
	1 Hour	20 ppm	35 ppm	
Nitrogen Dioxide	Annual Mean	0.03 ppm	0.053 ppm	Same as primary
	1 Hour	0.18 ppm	0.100 ppm	
Sulfur Dioxide	Annual Mean	-	0.030 ppm	-
	24 Hour	0.04 ppm	0.14 ppm	-
	3 Hour	-	-	0.50 ppm
	1 Hour	0.25 ppm	0.075 ppm	-
Respirable Particulate Matter (PM_{10})	Annual Mean	20 ug/m^3	-	Same as primary
	24 Hour	50 ug/m^3	150 ug/m^3	
Fine Particulate Matter ($PM_{2.5}$)	Annual Mean	12 ug/m^3	15 ug/m^3	Same as primary
	24 Hour	-	35 ug/m^3	
Sulfates	24 Hour	25 ug/m^3	-	-
Lead	30 Day Average	1.5 ug/m^3	-	-
	Calendar Quarter	-	1.5 ug/m^3	Same as primary
	Rolling 3-Month Average	-	0.15 ug/m^3	-
Hydrogen Sulfide	1 Hour	0.03 ppm	-	-
Vinyl Chloride	24 Hour	0.01 ppm	-	-

ppm = parts per million
ug/m^3 = micrograms per cubic meter

Source: BAAQMD, http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm, accessed October 2013.[7]

If SO_X is present during condensation, acid rain may occur. Exposure to high concentrations for short periods of time can constrict the bronchi and increase mucous flow, making breathing difficult. Children, the elderly, those with chronic lung disease, and asthmatics are especially susceptible to these effects.

Particulate Matter

Suspended particulate matter (airborne dust) consists of solid and liquid particles small enough to remain suspended in the air for long periods. "Respirable" particulate matter (PM) consists of particles less than 10 microns in diameter, and is defined as "suspended particulate matter" or PM_{10}. Particles between 2.5 and 10 microns in diameter arise primarily from natural processes, such as wind-blown dust or soil. Fine particles are less than 2.5 microns in diameter ($PM_{2.5}$). $PM_{2.5}$, by definition, is included in PM_{10}. Fine particles are produced mostly from combustion or burning activities. Fuel burned in cars and trucks, power plants, factories, fireplaces, and wood stoves produce fine particles.

Particulate matter is a complex mixture that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. The tiny particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. Particulate matter is divided into two classes, primary and secondary. Primary particles are released directly into the atmosphere from sources of generation. Secondary particles are formed in the atmosphere as a result of reactions involving gases. Particles greater than 10 microns in diameter can cause irritation in the nose, throat, and bronchial tubes. Natural mechanisms remove many of these particles, but smaller particles are able to pass through the body's natural defenses, including the mucous membranes of the upper respiratory tract, and enter into the lungs. The particles can damage the alveoli, tiny air sacs responsible for gas exchange in the lungs. The particles may also carry carcinogens and other toxic compounds, which adhere to the particle surfaces and can enter the lungs.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are also a category of environmental concern. TACs are a broad class of compounds found in ambient air, especially in urban areas, that are known to cause morbidity or mortality (usually because they cause cancer or serious illness). Health risks from TACs are a function of both the concentration of emissions and the duration of exposure, which typically are associated with long-term exposure and the associated risk of contracting cancer. Health effects of exposure to TACs (other than cancer) include birth defects, neurological damage, and death. Typically, TACs are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners), and are found in low concentrations, even near their source (e.g., diesel particulate matter near a highway). Cars and trucks release at least 40 different TACs. In terms of health risks, the most volatile contaminants are diesel particulate, benzene, formaldehyde, 1,3-butadiene and acetaldehyde. Public exposure to TACs can result from emissions from normal operations as well as accidental releases. Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level. The identification, regulation, and monitoring of TACs is relatively new compared to that for criteria air pollutants that have established AAQS. TACs are regulated or evaluated on the basis of risk to human health rather than comparison to an AAQS or emission-based threshold.

Diesel Particulate Matter

Diesel exhaust, in the form of diesel particulate matter (DPM), is the predominant TAC in urban air with the potential to cause cancer, representing approximately two-thirds of the cancer risk from TACs (based on the statewide average). According to the CARB, diesel exhaust is a complex mixture of gases, vapors, and fine particles, the complexity of which makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by CARB, and are listed as carcinogens either under the State's Proposition 65 or under the federal Hazardous Air Pollutants programs. California has adopted a comprehensive diesel risk reduction program. The USEPA and CARB adopted low-sulfur diesel fuel standards in 2006 that reduce DPM substantially. CARB recently adopted new regulations requiring the retrofit and/or

replacement of construction equipment on-highway diesel trucks and diesel buses in order to lower $PM_{2.5}$ emissions and reduce statewide cancer risk from diesel exhaust.

Attainment Status and Regional Air Quality Plans

Areas not meeting the national AAQS (NAAQS) presented in Table 4.1-2 above are designated by the USEPA as nonattainment. Further classifications of nonattainment areas are based on the severity of the nonattainment problem, with marginal, moderate, serious, severe, and extreme nonattainment classifications for ozone. Nonattainment classifications for PM range from marginal to serious. The Federal Clean Air Act (FCAA) requires areas violating the NAAQS to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The SIP contains the strategies and control measures for states to use to attain the NAAQS. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, rules, and regulations of air basins as reported by the agencies with jurisdiction over them. The USEPA reviews SIPs to determine if they conform to the mandates of the federal CAA amendments and would achieve air quality goals when implemented.

The CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA) of 1988. The CCAA classifies ozone nonattainment areas as moderate, serious, severe, and extreme based on severity of violations of the California AAQS (CAAQS). For each nonattainment area classification, the CCAA specifies air quality management strategies that must be adopted. For all nonattainment areas, attainment plans are required to demonstrate a five-percent-per-year reduction in nonattainment air pollutants or their precursors, averaged every consecutive three-year period, unless an approved alternative measure of progress is developed. Air districts with air quality that is in violation of CAAQS are required to prepare an air quality attainment plan that lays out a program to attain the CCAA mandates.

Table 4.1-3 presents the current attainment status of the SFBAAB, including Contra Costa County. As shown in the table, the area is currently designated as a nonattainment area for the State and federal ozone, State and federal $PM_{2.5}$, and State PM_{10} standards. The SFBAAB is designated attainment or unclassified for all other AAQS.

In compliance with regulations, the BAAQMD periodically prepares and updates air quality plans that provide emission reduction strategies to achieve attainment of the AAQS, including control strategies to reduce air pollutant emissions via regulations, incentive programs, public education, and partnerships with other agencies. The current air quality plans are prepared in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG).

The most recent federal ozone plan is the 2001 Ozone Attainment Plan, which is a proposed revision to the Bay Area part of the SIP to achieve the federal ozone standard.[8] The plan was adopted on October 24, 2001 and approved by the CARB on November 1, 2001. The plan was submitted to the USEPA on November 30, 2001 for review and approval as a revision to the SIP. In addition, in order to fulfill federal air quality planning requirements, the BAAQMD adopted a

$PM_{2.5}$ emissions inventory for the year 2010, which was submitted to the USEPA on January 14, 2013 for inclusion in the SIP.

Table 4.1-3
Contra Costa County Attainment Status Designations

Pollutant	Averaging Time	California Standards	Federal Standards
Ozone	1 Hour	Nonattainment	-
	8 Hour	Nonattainment	Nonattainment
Carbon Monoxide	8 Hour	Attainment	Attainment
	1 Hour	Attainment	Attainment
Nitrogen Dioxide	Annual Mean	-	Attainment
	1 Hour	Attainment	Unclassified
Sulfur Dioxide	Annual Mean	-	Attainment
	24 Hour	Attainment	Attainment
	3 Hour	-	Unclassified
	1 Hour	Attainment	Attainment
Respirable Particulate Matter (PM_{10})	Annual Mean	Nonattainment	-
	24 Hour	Nonattainment	Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Annual Mean	Nonattainment	Attainment
	24 Hour	-	Nonattainment
Sulfates	24 Hour	Attainment	-
Lead	30 Day Average	-	Attainment
	Calendar Quarter	-	Attainment
	Rolling 3-Month Average	-	Attainment
Hydrogen Sulfide	1 Hour	Unclassified	-
Vinyl Chloride	24 Hour	Unclassified	-

Source: BAAQMD, http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm, accessed October 2013.[9]

The most recent State ozone plan is the 2010 Clean Air Plan (CAP), adopted on September 15, 2010.[10] The 2010 CAP was developed as a multi-pollutant plan that provides an integrated control strategy to reduce ozone, PM, TACs, and GHGs. Although the CCAA does not require the region to submit a plan for achieving the State PM_{10} standard, the BAAQMD has prioritized measures to reduce PM in developing the control strategy for the 2010 CAP. The control strategy serves as the backbone of the BAAQMD's current PM control program. The 2010 Plan defined a comprehensive control strategy including 55 control measures to reduce emissions of PM and other air pollutants from a wide variety of emission sources. As these measures are implemented, emissions of primary PM and precursors to the formation of secondary PM would be reduced throughout the Bay Area. It should be noted that on January 9, 2013, the USEPA issued a final rule to determine that the San Francisco Bay Area has attained the 24-hour $PM_{2.5}$ federal standard, which suspends federal SIP planning requirements for the Bay Area.

The aforementioned air quality plans contain mobile source controls, stationary source controls, and transportation control measures (TCMs) to be implemented in the region to attain the State and federal standards within the SFBAAB. The plans are based on population and employment projections provided by local governments, usually developed as part of the General Plan update process.

Local Air Quality Monitoring

The BAAQMD operates a regional network of air pollution monitoring stations that provide information on ambient concentrations of criteria air pollutants and TACs. The site is located between two air quality monitoring sites – the Concord monitoring site, which is located approximately 10 miles southwest of the project site at 2975 Treat Boulevard, and the Bethel Island Road monitoring site, which is located approximately 11 miles east of the project site. Table 4.1-4 and Table 4.1-5 show historical occurrences of pollutant levels exceeding the State and federal AAQS for the three-year period from 2011 to 2013. The number of days that each standard was exceeded is presented in the tables as well.

Table 4.1-4
Air Quality Data Summary for the Concord Monitoring Site (2011-2013)

Pollutant	Standard	Days Standard Was Exceeded		
		2011	2012	2013
Ozone	State 1-Hour	2	0	0
Ozone	Federal 1-Hour	0	0	0
Ozone	State 8-hour	5	3	0
Ozone	Federal 8-Hour	2	2	0
PM_{10}	State 24-Hour	1	0	1
PM_{10}	Federal 24-Hour	0	0	0
$PM_{2.5}$	State Annual Mean	7.9	6.6	7.6
$PM_{2.5}$	Federal 24-Hour	2	0	1
Carbon Monoxide	State/Federal 8-Hour	0	0	0
Nitrogen Dioxide	State 1-Hour	0	0	0
Sulfur Dioxide	State 24-Hour	0	0	0

Source: California Air Resources Board, Aerometric Data Analysis and Management (iADAM) System, http://www.arb.ca.gov/adam/welcome.html, accessed June 2014. [11]

Table 4.1-5
Air Quality Data Summary for the Bethel Island Road Air Quality Monitoring Site (2011-2013)

Pollutant	Standard	Days Standard Was Exceeded		
		2011	2012	2013
Ozone	State 1-Hour	0	1	0
Ozone	Federal 1-Hour	0	0	0
Ozone	State 8-hour	4	4	1
Ozone	Federal 8-Hour	2	2	0
PM_{10}	State 24-Hour	0	1	1
PM_{10}	Federal 24-Hour	0	0	N/A
$PM_{2.5}$	State/Federal[1]	N/A	N/A	N/A
Carbon Monoxide	State/Federal 8-Hour	0	0	0
Nitrogen Dioxide	State 1-Hour	0	0	0
Sulfur Dioxide	State 24-Hour	0	0	0

[1] Values for $PM_{2.5}$ were not available for the Bethel Island air quality monitoring site.

Source: California Air Resources Board, Aerometric Data Analysis and Management (iADAM) System, http://www.arb.ca.gov/adam/welcome.html, accessed June 2014. [12]

As shown in the tables, the State AAQS, as well as the federal 8-Hour AAQS, for ozone were exceeded. In addition, the State PM_{10}, and State and federal $PM_{2.5}$, AAQS were exceeded. All other State and federal AAQS were met in the area.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. Heightened sensitivity may be caused by health problems, proximity to the emissions source, and/or duration of exposure to air pollutants. Children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the effects of air pollution. The BAAQMD defines sensitive receptors as facilities where sensitive receptor population groups (i.e., children, the elderly, the acutely ill, and the chronically ill) are likely to be located. Accordingly, land uses that are typically considered to be sensitive receptors include residences, schools, playgrounds, childcare centers, retirement homes, convalescent homes, hospitals, and medical clinics.

The proposed project involves the creation of new housing; thus, would introduce new sensitive receptors to the area. Accordingly, the proposed project would be considered a sensitive receptor. In addition, existing sensitive receptors in the vicinity of the project area include Turner Elementary School, which is located approximately 1,700 feet north of the eastern portion of the project site, the surrounding residential developments, and a number of nearby parks. The single-family residences located to the south and west of the site would be considered the closest sensitive receptors to the project site. The residences located to the east and north are further from the project site.

GHG Emissions and Global Climate Change

The Earth's climate is determined by the balance between energy received from the sun and energy emitted back to space from the Earth and its atmosphere. Certain gases in the atmosphere, such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), water vapor, and others, trap some of the outgoing energy, retaining heat in the Earth's atmosphere. Such gases that absorb and emit radiation within the thermal infrared range, trapping heat in the earth's atmosphere are considered GHGs. The increase in atmospheric concentrations of GHG has resulted in more heat being held within the atmosphere, which is the accepted explanation for global climate change. Some GHGs occur naturally and are emitted into the atmosphere through both natural processes and human activities. Other GHGs are created and emitted solely through human activities. Naturally occurring GHGs include water vapor, CO_2, CH_4, N_2O, and ozone. Certain human activities add to the levels of most of the naturally occurring gases. Other GHGs that are not naturally occurring include fluorinated carbons.

The primary GHG emitted by human activities is CO_2, with the next largest components being CH_4 and N_2O. The primary sources of CH_4 emissions include domestic livestock sources, decomposition of wastes in landfills, releases from natural gas systems, coal mine seepage, and manure management. The main human activities producing N_2O are agricultural soil management, fuel combustion in motor vehicles, nitric acid production, manure management, and stationary fuel combustion. Emissions of GHG by economic sector indicate that energy-

related activities account for the majority of U.S. emissions. Electricity generation is the largest single-source, and transportation is the second largest source, followed by industrial activities. The agricultural, commercial, and residential sectors account for the remainder of emissions. Emissions of GHGs are offset by uptake of carbon and sequestration in forests, trees in urban areas, agricultural soils, and landfilled yard trimmings and food scraps. Attainment concentration standards for GHGs have not been established by the federal or State government.

Global Warming Potential

Global Warming Potential (GWP) is one type of simplified index (based upon radiative properties) that can be used to estimate the potential future impacts of emissions of various gases. According to the USEPA, the global warming potential of a gas, or aerosol, to trap heat in the atmosphere is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas." The reference gas for comparison is CO_2. GWP is based on a number of factors, including the heat-absorbing ability of each gas relative to that of CO_2, as well as the decay rate of each gas relative to that of CO_2. Each gas's GWP is determined by comparing the radiative forcing associated with emissions of that gas versus the radiative forcing associated with emissions of the same mass of CO_2, for which the GWP is set at one. Methane gas, for example, is estimated by the USEPA to have a comparative global warming potential 21 times greater than that of CO_2, as shown in Table 4.1-6.

Table 4.1-6
Global Warming Potentials and Atmospheric Lifetimes of Select GHGs

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100 year time horizon)
Carbon Dioxide	50-200	1
Methane	12±3	21
Nitrous Oxide	120	310
HFC-23	264	11,700
HFC-134a	14.6	1,300
HFC-152a	1.5	140
PFC: Tetrafluoromethane (CF_4)	50,000	6,500
PFC: Hexafluoroethane (C_2F_6)	10,000	9,200
Sulfur Hexafluoride (SF_6)	3,200	23,900

Source: USEPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 -2011, April 2013.[13]

As shown in the table, at the extreme end of the scale, sulfur hexafluoride is estimated to have a comparative global warming potential 23,900 times that of CO_2. The "specified time horizon" is related to the atmospheric lifetimes of such GHGs, which are estimated by the USEPA to vary from 50-200 years for CO_2, to 50,000 years for tetrafluoromethane. Longer atmospheric lifetimes allow GHG to buildup in the atmosphere; therefore, longer lifetimes correlate with the global warming potential of a gas. The common indicator for GHG is expressed in terms of metric tons of CO_2 equivalents ($MTCO_2e$).

Analysis of GHGs and Global Climate Change

Analysis of global climate change presents the challenge of analyzing the relationship between local and global activities. GHGs are not generally thought of as traditional air pollutants because GHGs, and their impacts, are global in nature, while air pollutants affect the health of people and other living things at ground level in the general region. Accordingly, the issue of global climate change is different from any other areas of air quality impact analysis. A global climate change analysis must be conducted on a global level, rather than the typical local or regional setting, and requires consideration of not only emissions from the project under consideration, but also the extent of the displacement, translocation, and redistribution of emissions.

In the usual context, where air quality is linked to a particular location or area, it is appropriate to consider the creation of new emissions in that specific area to be an environmental impact whether or not the emissions are truly "new" emissions to the overall globe. In fact, the approval of a new developmental plan or project does not necessarily create new automobile drivers – the primary source of a land use project's emissions. Rather, a new land use project may simply be redistributing existing mobile emissions; accordingly, the use of models that measure overall emissions increases without accounting for existing emissions will substantially overstate the impact of the development project on global warming. Thus, an accurate analysis of GHG emissions substantially differs from other air quality impacts, where the "addition" of redistributed emissions to a new locale can make a substantial difference to overall air quality in that area.

REGULATORY CONTEXT

Air quality is monitored through the efforts of various international regulations and federal, State, regional, and local government agencies. The agencies work jointly and individually to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for regulating and improving the air quality within the City of Pittsburg area are discussed below.

Federal Regulations

The most prominent federal regulation is the FCAA, which is implemented and enforced by the USEPA.

FCAA and USEPA

The FCAA requires the USEPA to set NAAQS and designate areas with air quality not meeting NAAQS as nonattainment. The USEPA is responsible for enforcement of NAAQS for atmospheric pollutants and regulates emission sources that are under the exclusive authority of the federal government including emissions of GHGs. The USEPA's air quality mandates are drawn primarily from the FCAA, which was signed into law in 1970. Congress substantially amended the FCAA in 1977 and again in 1990.

The EPA has adopted policies consistent with FCAA requirements demanding states to prepare SIPs that demonstrate attainment and maintenance of the NAAQS. The 1990 amendments of the FCAA added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. The USEPA has responsibility to review all state SIPs to determine conformance to the mandates of the FCAA, and the amendments thereof, and determine if implementation would achieve air quality goals. If the USEPA determines a SIP to be inadequate, a Federal Implementation Plan may be prepared for the nonattainment area that imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in sanctions to transportation funding and stationary air pollution sources in the air basin.

The USEPA has been directed to develop regulations to address the GHG emissions of cars and trucks. The Mandatory Reporting of Greenhouse Gases Rule requires reporting of GHG emissions from large sources and suppliers in the U.S., and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHG, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to the USEPA.

To track the national trend in emissions and removals of GHG since 1990, USEPA develops the official U.S. GHG inventory each year. The national GHG inventory is submitted to the United Nations in accordance with the United Nations Framework Convention on Climate Change (UNFCCC).

On December 7, 2009, USEPA issued findings under Section 202(a) of the FCAA concluding that GHGs are pollutants that could endanger public health. Under the so-called Endangerment Finding, USEPA found that the current and projected concentrations of the six key well-mixed GHGs – CO_2, CH_4, N_2O, PFCs, SF_6, and HFCs – in the atmosphere threaten the public health and welfare of current and future generations. These findings do not, by themselves, impose any requirements on industry or other entities.

State Regulations

California has adopted a variety of regulations aimed at reducing air pollution and GHG emissions. The adoption and implementation of the key State legislation described in further detail below demonstrates California's leadership in addressing air quality and global climate change.

CCAA and CARB

The CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the CCAA. The CCAA requires that air quality plans be prepared for areas of the State that have not met the CAAQS for ozone, CO, NO_X, and SO_2. Among other requirements of the CCAA, the plans must include a wide range of implemental control measures, which often include transportation control measures and

performance standards. In order to implement the transportation-related provisions of the CCAA, local air pollution control districts have been granted explicit authority to adopt and implement transportation controls. The CARB, California's air quality management agency, regulates and oversees the activities of county air pollution control districts and regional air quality management districts. The CARB regulates local air quality indirectly using State standards and vehicle emission standards, by conducting research activities, and through planning and coordinating activities. In addition, the CARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the NAAQS established by the USEPA. Furthermore, the CARB is charged with developing rules and regulations to cap and reduce GHG emissions.

The most prominent and applicable California air quality- and GHG-related legislation are included below; however, an exhaustive list and extensive details of California air quality legislation could be found at the CARB website (www.arb.ca.gov).

Senate Bill 656

In 2003, the Legislature passed Senate Bill (SB) 656 to reduce public exposure to PM_{10} and $PM_{2.5}$. The legislation requires the CARB, in consultation with local air pollution control and air quality management districts, to adopt a list of the most readily available, feasible, and cost-effective control measures that could be implemented by air districts to reduce PM_{10} and $PM_{2.5}$. The legislation establishes a process for achieving near-term reductions in PM throughout California ahead of federally required deadlines for $PM_{2.5}$, and provides new direction on PM reductions in those areas not subject to federal requirements for PM. Sources categories addressed by SB 656 include measures to address residential wood combustion and outdoor greenwaste burning, fugitive dust sources such as paved and unpaved roads and construction, combustion sources such as boilers, heaters, and charbroiling, solvents and coatings, and product manufacturing. Some of these measures include, but are not limited to, the following:

- Reduce or eliminate wood-burning devices allowed;
- Prohibit residential open burning;
- Permit and provide performance standards for controlled burns;
- Require water or chemical stabilizers/dust suppressants during grading activities;
- Limit visible dust emissions beyond the project boundary during construction;
- Require paving/curbing of roadway shoulder areas; and
- Require street sweeping.

Assembly Bill 32

In September 2006, then-Governor Arnold Schwarzenegger signed Assembly Bill (AB) 32, the California Climate Solutions Act of 2006 (Stats. 2006, ch. 488) (Health & Saf. Code, §38500 et seq.). AB 32 delegated the authority for its implementation to the CARB and directs CARB to enforce the State-wide cap. Among other requirements, AB 32 required CARB to (1) identify the State-wide level of GHG emissions in 1990 to serve as the emissions limit to be achieved by 2020, and (2) develop and implement a Scoping Plan. Accordingly, the CARB has prepared the *Climate Change Scoping Plan* (Scoping Plan) for California, which was approved in 2008.[14] The

Scoping Plan provides the outline for actions to reduce California's GHG emissions. Based on the reduction goals called for in the 2008 Scoping Plan, a 29 percent reduction in GHG levels relative to a Business As Usual (BAU) scenario would be required to meet 1990 levels by 2020. A BAU scenario is a baseline condition based on what could or would occur on a particular site in the year 2020 without implementation of a proposed project or any required or voluntary GHG reduction measures. A project's BAU scenario is project- and site-specific, and varies from project to project.

In 2011, the baseline or BAU level for the Scoping Plan was revised to account for the economic downturn and State regulation emission reductions (i.e., Pavley, Low Carbon Fuel Standard, and Renewables Portfolio Standard [RPS]).[15] According to the revisions, the Scoping Plan emission reduction target from BAU levels required to meet 1990 levels by 2020 was modified from 29 percent to 21 percent (where BAU levels is based on 2010 levels) or 16 percent (where BAU levels is based on 2010 levels including accounting for percentages of emission reductions captured for implementation of Pavley and RPS). The amended Scoping Plan was re-approved August 24, 2011.

California GHG Cap-and-Trade Program

The AB 32 Scoping Plan identifies a cap-and-trade program as one of the strategies California will employ to reduce the GHG emissions that cause climate change. The program will help put California on the path to meet the GHG emission reduction goal of 1990 levels by the year 2020, and ultimately achieving an 80 percent reduction from 1990 levels by 2050. Under cap-and-trade, an overall limit on GHG emissions from capped sectors would be established by the cap-and-trade program and facilities subject to the cap would be able to trade permits (allowances) to emit GHGs. The CARB has designed a California cap-and-trade program that is enforceable and meets the requirements of AB 32. The program started on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions.

AB 1493

California AB 1493 (Stats. 2002, ch. 200) (Health & Safety Code, §§42823, 43018.5), known as Pavley, was enacted on July 22, 2002. AB 1493 requires that the CARB develop and adopt regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty truck and other vehicles determined by the CARB to be vehicles whose primary use is noncommercial personal transportation in the state." On June 30, 2009, the USEPA granted a waiver of CAA preemption to California for the State's GHG emission standards for motor vehicles, beginning with the 2009 model year. Pursuant to the CAA, the waiver allows for the State to have special authority to enact stricter air pollution standards for motor vehicles than the federal government's. The CARB estimates that the regulation would reduce GHG emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030.

Executive Order S-01-07

On January 18, 2007, then-Governor Schwarzenegger signed Executive Order S-01-07, which mandates that a State-wide goal be established to reduce carbon intensity of California's transportation fuels by at least 10 percent by 2020. The Order also requires that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California.

Executive Order S-03-05

On June 1, 2005, then-Governor Schwarzenegger signed Executive Order S-03-05, which established total GHG emission targets. Specifically, emissions are to be reduced to year 2000 levels by 2010, 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. The Executive Order directed the Secretary of the California Environmental Protection Agency (Cal-EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The Secretary is also directed to submit biannual reports to the governor and state legislature describing: (1) progress made toward reaching the emission targets; (2) impacts of global warming on California's resources; and (3) mitigation and adaptation plans to combat these impacts.

To comply with the Executive Order, the Secretary of the Cal-EPA created a Climate Act Team (CAT) made up of members from various State agencies and commissions. In March 2006, CAT released their first report. In addition, the CAT has released several "white papers" addressing issues pertaining to the potential impacts of climate change on California.

Renewables Portfolio Standard

Established in 2002 under SB 1078, accelerated in 2006 under SB 107, and expanded in 2011 under SB 2, California's RPS is one of the most ambitious renewable energy standards in the country. The RPS program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020.

SB 375

In September 2008, then-Governor Arnold Schwarzenegger signed SB 375, known as the Sustainable Communities and Climate Protection Act of 2008, which is intended to build on AB 32 by attempting to control GHG emissions by curbing sprawl. SB 375 enhances CARB's ability to reach goals set by AB 32 by directing CARB to develop regional GHG emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. In addition, CARB will work with the State's 18 metropolitan planning organizations, including the ABAG, to align their regional transportation, housing, and land-use plans and prepare a "Sustainable Communities Strategy" (SCS) to reduce the amount of vehicle miles traveled in their respective regions and demonstrate the region's ability to attain its greenhouse gas reduction targets. SB 375 provides incentives for creating walkable and sustainable communities and revitalizing existing communities, and allows home builders to get relief from certain environmental reviews under CEQA if they build projects consistent with the new sustainable community strategies.

Furthermore, SB 375 encourages the development of alternative transportation options, which will reduce traffic congestion.

On July 18, 2013, ABAG and MTC approved and adopted the Plan Bay Area, which includes the region's Sustainable Communities Strategy, the 2040 Regional Transportation Plan, and associated EIRs, to meet the requirements of SB 375.

California Building Standards Code

California's building codes (California Code of Regulations [CCR], Title 24) are published on a triennial basis, and contains standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. The California Building Standards Commission (CBSC) is responsible for the administration and implementation of each code cycle, which includes the proposal, review, and adoption process. Supplements and errata are issued throughout the cycle to make necessary mid-term corrections. The 2013 code has been prepared and became effective January 1, 2014, with minor exceptions to Part 6, Part 1, and energy provisions of Part 11, which became effective July 1, 2014. The California building code standards apply State-wide; however, a local jurisdiction may amend a building code standard if the jurisdiction makes a finding that the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

California Green Building Standards Code

The 2013 California Green Building Standards Code, otherwise known as the CALGreen Code (CCR Title 24, Part 11), became effective January 1, 2014. As mentioned above, the energy provisions of the CALGreen Code became effective July 1, 2014. The purpose of the CALGreen Code is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices. The provisions of the code apply to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure throughout California.

The key features of the CALGreen Code include the following mandates:

- 20 percent mandatory reduction in indoor water use, with voluntary goal standards for 30, 35 and 40 percent reductions;
- Separate indoor and outdoor water meters to measure nonresidential buildings' indoor and outdoor water use with a requirement for moisture-sensing irrigation systems for larger landscape projects;
- Diversion of 50 percent of construction waste from landfills, increasing voluntarily to 65 and 75 percent for new homes and 80 percent for commercial projects;
- Mandatory periodic inspections of energy systems (i.e., heat furnace, air conditioner, mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity according to their design efficiencies; and

- Mandatory use of low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particle board.

In addition to the mandatory measures listed above and to other State-wide mandates, the CALGreen Code encourages local governments to adopt more stringent voluntary provisions, known as Tier 1 and Tier 2 provisions, to further reduce emissions, improve energy efficiency, and conserve natural resources. If a local government adopts one of the tiers, the provisions become mandates for all new construction within that jurisdiction.

SB 97

SB 97, signed in August 2007, acknowledges that climate change is an important environmental issue that requires analysis under CEQA. The bill directs the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, by July 1, 2009.

As directed by SB 97, the Governor's Office of Planning and Research (OPR) amended the CEQA Guidelines, effective March 18, 2010, to provide guidance to public agencies regarding the analysis and mitigation of GHG emissions and the effects of GHG emissions in draft CEQA documents. The amendments include revisions to the *Appendix G Initial Study Checklist* that incorporates a new subdivision to address project-generated GHG emissions and contribution to climate change. The new subdivision emphasizes that the effects of GHG emissions are cumulative, and should be analyzed in the context of CEQA's requirements for cumulative impacts analysis. In addition, the revisions include a new subdivision to assist lead agencies in determining the significance of project related GHG emissions such as the extent to which the project may generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, and whether the project conflicts with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of GHGs.

Guidance on determining the significance of impacts from GHG emissions is provided in the amendments. The guidance suggests a careful judgment be made by the lead agency that should make a good-faith effort, based on available information, to describe, calculate or estimate the amount of GHG emissions resulting from a project. When assessing the significance of impacts from GHG emissions on the environment, lead agencies can consider the extent to which the project may increase or reduce GHG as compared to the existing environmental setting, whether the project emissions exceed a threshold of significance determined applicable to the project, and/or the extent to which the project complies with adopted regulations or requirements to implement a State-wide, regional, or local plan for the reduction or mitigation of GHG emissions. When adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.

If GHG emissions of a project are determined to be significant, feasible means of mitigating GHG emissions, such as the following, shall be applied:

- Measurement of the reduction of emissions required as part of the lead agency's decision;
- Reductions in emissions resulting from project through project features, design, or other measures;
- Off-site measures, including offsets, to mitigate a project's emissions;
- Measures that sequester GHG gases; and
- If a GHG reduction plan, ordinance, regulation, or other similar plan is adopted, mitigation may include project-by-project measures, or specific measures or policies found in the plan that reduces the cumulative effect of emissions.

Local Regulations

Bay Area Air Quality Management District

The BAAQMD is the public agency entrusted with regulating stationary sources of air pollution in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties. The BAAQMD has prepared their own *CEQA Air Quality Guidelines* (May 2011), which is intended to be utilized for assistance with CEQA review. The BAAQMD *CEQA Air Quality Guidelines* include thresholds of significance and project screening levels for criteria air pollutants (ROG, NO_X, PM_{10}, and $PM_{2.5}$), GHGs, toxic air contaminants (TACs), carbon monoxide (CO), and odors, as well as methods to assess and mitigate project-level and plan-level impacts.

It should be noted that the BAAQMD was challenged in Alameda County Superior Court, on the basis that the BAAQMD failed to comply with CEQA when it adopted its CEQA guidelines, and associated thresholds of significance. The BAAQMD was ordered to set aside the thresholds and conduct CEQA review of the proposed thresholds. On August 13, 2013, the First District Court of Appeal reversed the trial court's decision striking down BAAQMD's CEQA thresholds of significance for GHG emissions. The Court of Appeal's held that CEQA does not require BAAQMD to prepare an EIR before adopting thresholds of significance to assist in the determination of whether air emissions of proposed projects might be deemed "significant." The Court of Appeal's decision provides the means by which BAAQMD may ultimately reinstate the GHG emissions thresholds, though the court's decision did not become immediately effective. It should be further noted that a petition for review has been filed; however, the court has limited its review to the following issue: Under what circumstances, if any, does CEQA require an analysis of how existing environmental conditions will impact future residents or users (receptors) of a proposed project? Ultimately, the thresholds of significance used to evaluate proposed developments are determined by the CEQA lead agency, which would be the City of Pittsburg for the proposed project.

Regional Air Quality Plans

As discussed above, the 2001 Ozone Attainment Plan was prepared as a revision to the Bay Area part of the SIP to achieve the federal ozone standard. The plan was adopted on October 24, 2001, approved by the CARB on November 1, 2001, and was submitted to the USEPA on November 30, 2001 for review and approval as a revision to the SIP. In addition, in order to fulfill federal

air quality planning requirements, the BAAQMD adopted a $PM_{2.5}$ emissions inventory for the year 2010, which was submitted to the USEPA on January 14, 2013 for inclusion in the SIP.

The most recent State ozone plan is the 2010 Clean Air Plan (CAP), adopted on September 15, 2010. The 2010 CAP was developed as a multi-pollutant plan that provides an integrated control strategy to reduce ozone, PM, TACs, and GHGs. Although the CCAA does not require the region to submit a plan for achieving the State PM_{10} standard, the BAAQMD has prioritized measures to reduce PM in developing the control strategy for the 2010 CAP. It should be noted that on January 9, 2013, the USEPA issued a final rule to determine that the San Francisco Bay Area has attained the 24-hour $PM_{2.5}$ federal standard, which suspends federal SIP planning requirements for the Bay Area.

The aforementioned applicable air quality plans contain mobile source controls, stationary source controls, and TCMs to be implemented in the region to attain the State and federal standards within the SFBAAB. The plans are based on population and employment projections provided by local governments, usually developed as part of the General Plan update process.

Rules and Regulations

All projects under the jurisdiction of the BAAQMD are required to comply with all applicable BAAQMD rules and regulations. BAAQMD's regulations and rules include, but are not limited to, the following:

- Regulation 6: Particulate Matter and Visible Emissions
  - Rule 3: Wood-burning Devices
- Regulation 7: Odorous Substances
- Regulation 8: Organic Compounds
  - Rule 3: Architectural Coatings

<u>City of Pittsburg General Plan</u>

The following are applicable General Plan goals and policies related to air quality from the City of Pittsburg General Plan:

Goal 9-G-9 Work toward improving air quality and meeting all Federal and State ambient air quality standards by reducing the generation of air pollutants from stationary and mobile sources.

Goal 9-G-10 Reduce the potential for human discomfort or illness due to local concentrations of toxic contaminants, odors and dust.

Goal 9-G-11 Reduce the number of motor vehicle trips and emissions accounted to Pittsburg residents and encourage land use and transportation strategies that promote use of alternatives to the automobile for transportation, including bicycling, bus transit, and carpooling.

Policy 9-P-29 Cooperate with the Bay Area Air Quality Management District to achieve emissions reductions for ozone and its precursor, PM-10.

Policy 9-P-30 Cooperate with Bay Area Air Quality Management District to ensure compliance with dust abatement measures during construction.

These measures would reduce particulate emissions from construction and grading activities.

Policy 9-P-33 Encourage new residential development and remodeled existing homes to install clean-burning fireplaces and wood stoves.

Residential woodburning is a growing source of localized air pollution. Woodsmoke released from fireplaces and wood stoves contains carbon monoxide, nitrogen dioxide, and PM-10. Pollution can be reduced by installing gas fireplaces or EPA certified wood heaters.

IMPACTS AND MITIGATION MEASURES

This section describes the standards of significance and methodology utilized to analyze and determine the proposed project's potential impacts related to air quality and GHG emissions. A discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

The BAAQMD has established significance thresholds for emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with proposed development projects, as presented in Table 4.1-7. The significance thresholds are expressed in pounds per day (lbs/day) for construction and operational emissions, and tons per year for cumulative emissions.

Table 4.1-7
BAAQMD Thresholds of Significance

Pollutant	Construction (lbs/day)	Operational (lbs/day)	Cumulative (tons/year)
ROG	54	54	10
NO_X	54	54	10
PM_{10}	82	82	15
$PM_{2.5}$	54	54	10

Source: BAAQMD, CEQA Guidelines, May 2011.

The BAAQMD threshold of significance for project-level operational GHG emissions is 1,100 metric tons of CO_2 equivalents ($MTCO_2e$) per year. BAAQMD does not have an adopted

threshold of significance for construction-related GHG emissions and does not require quantification.

According to the BAAQMD, a significant impact related to TAC would occur if a project would result in any of the following:

- An increase in cancer risk levels of more than 10 in one million, or a non-cancer (chronic or acute) hazard index greater than 1.0; or
- An incremental increase in cancer risk levels of more than 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average $PM_{2.5}$.

A cumulatively considerable impact associated with TACs would occur if the aggregate total of all past, present, and foreseeable future sources within an 1,000-foot radius of the fence line of a source or from the location of a receptor, plus the contribution from the project, would exceed the following:

- An increase in cancer risk levels of more than 100 in one million or a chronic non-cancer hazard index (from all sources) greater than 10.0; or
- An incremental increase in cancer risk levels of more than 0.8 $\mu g/m^3$ annual average $PM_{2.5}$.

The BAAQMD thresholds of significance associated with localized CO emissions of 20.0 parts per million (ppm) for a 1-hour averaging time and 9.0 ppm for an 8-hour averaging time. In order to provide a conservative indication of whether a project would result in localized CO emissions that would exceed the applicable threshold of significance, the BAAQMD has established screening criteria for localized CO emissions. According to BAAQMD, a proposed project would result in a less-than-significant impact related to localized CO emission concentrations if the following screening criteria are met:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans;
- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; and
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, underpass, etc.).

As stated previously, BAAQMD was challenged in Alameda County Superior Court, and was ordered to set aside the thresholds and conduct CEQA review of the proposed thresholds. On August 13, 2013, the First District Court of Appeal reversed the trial court's decision striking down BAAQMD's CEQA thresholds of significance for GHG emissions. The Court of Appeal's held that CEQA does not require BAAQMD to prepare an EIR before adopting thresholds of significance to assist in the determination of whether air emissions of proposed projects might be deemed "significant." The Court of Appeal's decision provides the means by which BAAQMD

may ultimately reinstate the GHG emissions thresholds, though the court's decision did not become immediately effective. It should be further noted that a petition for review has been filed; however, the court has limited its review to the following issue: Under what circumstances, if any, does CEQA require an analysis of how existing environmental conditions will impact future residents or users (receptors) of a proposed project? Ultimately, the thresholds of significance used to evaluate proposed developments are determined by the CEQA lead agency, which would be the City of Pittsburg for the proposed project. Per CEQA Guidelines Section 15064.7, the City has elected to use the BAAQMD's thresholds and methodology for this project, as they are based on substantial evidence and remain the most up-to-date, scientifically-based method available to evaluate air quality impacts. Thus, the BAAQMD's thresholds of significance are utilized for this analysis.

Based on the recommendations of BAAQMD as presented above and consistent with Appendix G of the CEQA Guidelines, a significant impact associated with air quality and/or GHG emissions would occur if the proposed project would result in any of the following:

- Generation of short-term construction-related criteria air pollutant emissions in excess of the BAAQMD thresholds (i.e., 54 lbs/day for ROG, NO_X, and $PM_{2.5}$ and 82 lbs/day for PM_{10});
- Generation of long-term operational criteria air pollutant emissions in excess of the BAAQMD thresholds (i.e., 54 lbs/day for ROG, NO_X, and $PM_{2.5}$ and 82 lbs/day for PM_{10});
- Conflict with or obstruct implementation of regional air quality plans;
- Exposure of sensitive receptors or the general public to substantial levels of pollutant concentrations (i.e., localized CO emissions of 20.0 ppm for 1-hour averaging time or 9.0 ppm for 8-hour averaging time; increase in cancer risk levels of more than 10 in one million or a non-cancer hazard index greater than 1.0; incremental increase in cancer risk levels of more than 0.3 $\mu g/m^3$ annual average $PM_{2.5}$; cumulative increase in cancer risk of more than 100 in one million or cumulative non-cancer hazard index greater than 10.0; and cumulative incremental increase in cancer risk levels of more than 0.8 $\mu g/m^3$ annual average $PM_{2.5}$);
- Generation of cumulative criteria air pollutant emissions in excess of the BAAQMD thresholds (i.e., 10 tons/year for ROG, NO_X, and $PM_{2.5}$ and 15 tons/year for PM_{10}); and
- Generation of a cumulatively considerable contribution to GHG emissions in excess of the BAAQMD threshold (i.e., 1,100 $MTCO_2e$ per year or 4.6 $MTCO_2e$ per service population per year).

Method of Analysis

A comparison of the proposed project's emissions to the thresholds discussed above shall determine the significance of the proposed project's potential impacts to air quality and climate change. Emissions attributable to the proposed project which exceed the significance thresholds could have a significant effect on regional air quality and the attainment of the federal and State AAQS. Where potentially significant air quality impacts are identified, mitigation measures are described that would reduce or eliminate the impact.

Emission Estimations

Project emissions were quantified using the California Emissions Estimator Model (CalEEMod) version 2013.2.2 software - a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify air quality emissions, including GHG emissions, from land use projects. The model applies inherent default values for various land uses, including trip generation rates based on the Institute of Transportation Engineers (ITE) Manual, vehicle mix, trip length, average speed, etc. However, where project-specific data was available, such data was input into the model (e.g., construction phases and timing, project trip generation rates, energy efficient design features, etc.). Results of the modeling are expressed in lbs/day for construction and operational emissions, in tons/yr for cumulative emissions, and in $MTCO_2e$/yr for GHG emissions which allows for comparison between the model results and the BAAQMD significance thresholds. All modeling results are provided in Appendix E.

Emissions of TACs were evaluated in the Health Risk Assessment prepared for the proposed project by Illingsworth & Rodkin, Inc (see Appendix D). The Health Risk Assessment included an evaluation of impact on the proposed project site from nearby sources, including local roadways and stationary sources, as well as construction-related emissions associated with the proposed project upon existing sensitive receptors in the area. Roadway TAC emissions were evaluated using the BAAQMD's roadway screening analysis table for Contra Costa County in conjunction with traffic volume data provided by the project traffic consultant. Stationary source information was obtained from the BAAQMD Google Earth Stationary Source Screening Analysis Tool. Construction-related TAC emissions were computed using CalEEMod along with the anticipated construction activity, as well as the USEPA ISCST3 dispersion model. Details of the ISCST3 modeling, including inputs and results, are provided in Appendix D.

Project-Specific Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in comparison with the standards of significance identified above.

4.1-1 Short-term construction-related air quality. Based on the analysis below and with the implementation of mitigation, the impact is *less than significant.*

Construction of the proposed project was anticipated to commence in March 2015 and would be carried out in approximately 15 one-year phases. During construction of the project, various types of equipment and vehicles would temporarily operate on the project site. Construction exhaust emissions would be generated from construction equipment, vegetation clearing and earth movement activities, construction workers' commute, and construction material hauling for the entire construction period. The aforementioned activities would involve the use of diesel- and gasoline-powered equipment that would generate emissions of criteria pollutants. Project construction activities also represent sources of fugitive dust, which includes PM_{10} and $PM_{2.5}$ emissions. As construction of the proposed project would generate air pollutant emissions intermittently within the site, and in the vicinity of the site, until all construction has been completed, construction is a

potential concern because the proposed project is in a nonattainment area for ozone and PM.

Because construction of the proposed project would occur in similar one-year phases over approximately 15 phases, only one, one-year phase of construction was modeled to determine the maximum pounds per day emissions associated with each of the identical one-year phases. In order to present a conservative analysis, the first one-year phase was modeled, because emissions would reduce over time as older, higher polluting off-road equipment are retired and replaced with newer, cleaner equipment. In addition to the advancement of vehicle and equipment efficiency, more stringent standards and regulations as time progresses, such as State regulation emission reductions would attribute to a reduction of emissions over time as well.

The proposed project is required to comply with all BAAQMD rules and regulations including Regulation 8, Rule 3 related to architectural coatings. In addition, all projects under the jurisdiction of the BAAQMD are recommended to implement all of the Basic Construction Mitigation Measures provided in the BAAQMD CEQA Guidelines, which include the following:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer‘s specifications. All equipment shall be checked by a certified visible emissions evaluator.
8. Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District‘s phone number shall also be visible to ensure compliance with applicable regulations.

Utilizing CalEEMod, the proposed project’s maximum construction-related emissions per any one phase of construction were estimated and are presented in Table 4.1-8.

Table 4.1-8 Maximum Unmitigated Project Construction-Related Emissions (lbs/day)				
	ROG	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Proposed Project	14.81	79.18	6.78	5.05
BAAQMD Thresholds	54	54	82	54
Exceed Thresholds?	**NO**	**YES**	**NO**	**NO**
Source: CalEEMod, June 2014 (see Appendix E).				

As presented in the above table, the proposed project would result in construction-related emissions of ROG, $PM_{10,}$ and $PM_{2.5}$ below the applicable thresholds of significance. However, emissions of NO_X would exceed the applicable threshold of significance. Therefore, the propose project could contribute to the region's nonattainment status of ozone and violate an air quality standard, and a ***potentially significant*** impact associated with construction-related emissions of NO_X would result.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the construction-related emissions of NO_X to below the applicable threshold of significance, as presented in Table 4.1-9. Thus, implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

Table 4.1-9 Maximum Mitigated Project Construction-Related Emissions (lbs/day)				
	ROG	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Proposed Project	11.75	51.08	4.36	2.93
BAAQMD Thresholds	54	54	82	54
Exceed Thresholds?	**NO**	**NO**	**NO**	**NO**
Source: CalEEMod, June 2014 (see Appendix E).				

4.1-1(a) *Prior to issuance of a grading permit for each phase of construction for the Tuscany Meadows Subdivision, the project applicant shall show on the grading plans via notation that the contractor shall ensure that all diesel-powered equipment larger than 50 horsepower and operating on the site for more than two days consecutively shall meet USEPA emissions standards for Tier 2 engines or equivalent. The grading plans shall be submitted for review and approval by the City Engineer.*

4.1-1(b) *Prior to issuance of a grading permit for each phase of construction for the Tuscany Meadows subdivision, the project applicant shall show on the grading plans via notation that the contractor shall ensure that all generators shall be alternatively fueled or meet USEPA emissions standards for Tier 4 engines or equivalent. The grading plans shall be submitted for review and approval by the City Engineer.*

4.1-2 Long-term operational air quality and a conflict with or obstruction of implementation of regional air quality plans. Based on the analysis below, even with implementation of mitigation, the impact is *significant and unavoidable*.

Operational emissions of ROG, NO_X, CO, and PM_{10} would be generated by the proposed project from both mobile and stationary sources. Day-to-day activities such as future resident vehicle trips to and from the project site would make up the majority of the mobile emissions. Emissions would occur from area sources such as natural gas combustion from heating mechanisms, landscape maintenance equipment exhaust, and consumer products (e.g., deodorants, cleaning products, spray paint, etc.).

As stated above, the project is required to comply with all BAAQMD rules and regulations including Regulations 6, Rule 3, associated with wood-burning devices, which restricts wood-burning devices in new building construction, and Regulation 8, Rule 3 related to architectural coatings, which requires use of low volatile organic compound (VOC) paints.

The proposed project's daily unmitigated operational emissions have been estimated using CalEEMod and are presented in Table 4.1-10. It should be noted that the proposed project's inherent site and sustainability features as described in the Project Description chapter have been applied to the modeling, including the project's density, proximity to existing transit stations, and pedestrian connection improvements. In addition, compliance with the applicable BAAQMD rules and regulations as noted above have been included in the modeling such as use of only low VOC paints. Furthermore, Mitigation Measure 4.9-5(c) in the Transportation, Traffic, and Circulation chapter requires the completion of the pedestrian trail between the apartments and the single family home portion of the project, for review and approval by the City Engineer.

Table 4.1-10
Unmitigated Project Operational Emissions (lbs/day)

	ROG	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Proposed Project	2,056.36	72.87	422.82	392.18
BAAQMD Thresholds	54	54	82	54
Exceed Thresholds?	**YES**	**YES**	**YES**	**YES**

Source: CalEEMod, June 2014 (see Appendix E).

As shown in the table, the proposed project would result in operational emissions of ROG, NO_X, $PM_{10,}$ and $PM_{2.5}$ in excess of the applicable thresholds of significance. Therefore, the propose project could contribute to the region's nonattainment status of ozone and PM, and violate air quality standards.

As stated previously, the applicable regional air quality plans include the 2001 Ozone Attainment Plan and the 2010 CAP. The air quality plans contain mobile source controls, stationary source controls, and TCMs to be implemented within the region to attain the State and federal ozone standards within the SFBAAB. According to the BAAQMD CEQA Guidelines, if a project would not result in significant and unavoidable air quality

impacts, after the application of all feasible mitigation, the project may be considered consistent with the air quality plans. In addition, BAAQMD recommends that projects incorporate all feasible air quality plan control measures, which include traditional stationary, area, mobile source and transportation control measures, as well as control measures that promote mixed use, compact development, and reduce vehicle emissions and exposure to pollutants from stationary and mobile sources. If approval of a project would not cause the disruption, delay, or otherwise hinder the implementation of any air quality plan control measure, the project may be considered consistent with the air quality plans. Because the proposed project would result in emissions above the applicable thresholds of significance, the project could conflict with or obstruct implementation of regional air quality plans.

Because the proposed project could contribute to the region's nonattainment status of ozone, violate an air quality standard, and conflict with or obstruct implementation of regional air quality plans, the impact associated with operational emissions would be ***significant***.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the proposed project emissions as shown in Table 4.1-11.

Table 4.1-11
Mitigated Project Operational Emissions (lbs/day)

	ROG	NO_X	PM_{10}	$PM_{2.5}$
Proposed Project	73.33	42.32	45.72	15.07
BAAQMD Thresholds	54	54	82	54
Exceed Thresholds?	**YES**	**NO**	**NO**	**NO**

Source: CalEEMod, June 2014 (see Appendix E).

As shown in the table, the emissions of ROG would still exceed the applicable threshold of significance. The majority of ROG emissions associated with the proposed project are from consumer products (e.g., deodorants, cleaning products, spray paint, aerosols, etc.). Potential measures that could be applied to reduce operational ROG emissions include providing electrical outlets on the outside of the proposed homes to encourage the use of electric landscaping equipment, limiting the VOC content beyond regulatory requirements of consumer products used in the proposed homes, or monitoring the use of consumer products in the proposed homes. Although such measures would reduce the overall operational ROG emissions associated with the proposed project, such measures cannot be enforced or regulated in any manner that would ensure a reduction of ROG emission to below the applicable threshold of significance. As further feasible mitigation measures do not exist that would ensure reduction of operational ROG emissions to below the applicable threshold of significance, the above impact would remain *significant and unavoidable*. Because the project would result in a significant and unavoidable impact after the application of all feasible mitigation, in accordance with the BAAQMD CEQA Guidelines, the project would not be considered consistent with the regional air quality plans.

4.1-2(a) *Wood-burning fireplaces, woodstoves, or similar wood-burning devices shall be prohibited throughout the proposed project plan area. Homes may be fitted with the applicable regulation compliant natural gas burning appliances if desired. The prohibition shall be included on any project plans submitted prior to issuance of building permits, subject to review and approval by the Chief Building Official.*

4.1-2(b) *Electrical outlets shall be provided on the outside of the homes to encourage the use of electrical landscaping equipment. The provision shall be included on any project plans submitted prior to issuance of building permits, subject to review and approval by the Chief Building Official.*

4.1-2(c) *The use of electrical landscaping equipment shall be encouraged within the homeowner's guide to be provided following the signing of each purchasing agreement. In addition, the homeowner's guide shall discuss the benefits of limiting the use of certain consumer products, including, but not limited to, high-VOC paints, barbeque lighter fluid, and aerosol sprays.*

4.1-2(d) *The City's Green Building Design Guidelines[16] shall be used to promote a reduction in residential emissions where feasible and appropriate, including, but not limited to, implementation of the following measures, subject to review and approval by the City Planning Department:*

- *Secure and convenient storage for at least two bicycles should be provided along the street side of the house. The storage location should be accessible by driveway, other hardscape, or dedicated path, and securable by lock. The storage may be an external unit that is fully enclosed or enclosed on three sides closest to the street to hide the bicycles from street view, or an entrance into a garage or other space inside the residential unit with sufficient space to store the bicycles. External units should be located with consideration for the layout of the building, and complement the color and design of the building as much as possible. Storage units may be wall mounted and store bicycles vertically. In addition, bicycle mounting systems should be allowed in garages to satisfy bicycle storage for single-family homes.*
- *Subdivisions should include a designated pedestrian route interconnecting all internal uses, site entrances, primary building entrances, public facilities, and adjacent uses to existing external bicycle and pedestrian facilities and streets.*
    - *Pedestrian and bicycle paths should provide safe, visible, and unobstructed bicycle and pedestrian*

access between facilities, from facility entrances to bicycle and pedestrian routes (sidewalks and bicycle lanes), and between facilities and existing or planned bicycle and pedestrian routes.

- *Greater emphasis should be placed on bicycle and pedestrian accessibility (location of routes) and connectivity (number of routes) rather than automobile accessibility/connectivity.*
- *Cul-de-sacs should include pedestrian and bicycle pathways that cut through the block from the cul-de-sac to the next street behind the parcels lining the cul-de-sac. Green space may be used to connect adjacent cul-de-sacs, creating a pedestrian connection as well as community open space.*
- *Spacing between pedestrian/bicycle connections should be no greater than 400 feet. This can be accomplished by creating mid-block paths and pedestrian shortcuts.*

- *Convenient, visible, and secure bicycle storage facilities should be available on site for multi-family residential areas, sufficient to accommodate demand of residents and guests.*
  - *Parking facilities may be lockers that may by locked individually.*
  - *Parking facilities may be locked storage rooms that are only accessible by building tenants and managers.*
  - *Parking facilities may be a storage area that is continuously monitored by on-site staff.*
- *Roofs should be pre-wired for solar panels and provision of solar panels offered as an option to buyers. Roofs should be covered with a cool roof under the energy generation structures. Roof segments that are uncovered by energy systems should host raised bed garden space or greenhouses, a green/living roof, or cool roof surfaces.*

4.1-3 Exposure of sensitive receptors to pollutant concentrations. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.

The major pollutant concentrations of concern are localized CO emissions and TAC emissions, which are addressed in further detail below.

Localized CO Emissions

Localized concentrations of CO are related to the levels of traffic and congestion along streets and at intersections. Implementation of the proposed project would increase traffic volumes on streets near the project site; therefore, the project would be expected to

increase local CO concentrations. High levels of localized CO concentrations are only expected where background levels are high, and traffic volumes and congestion levels are high. The statewide CO Protocol document[17] identifies signalized intersections operating at Level of Service (LOS) E or F, or projects that would result in the worsening of signalized intersections to LOS E or F, as having the potential to result in localized CO concentrations in excess of the State or federal AAQS, as a result of large numbers of cars idling at stop lights.

In accordance with the State CO Protocol, the BAAQMD has established preliminary screening criteria for determining whether the effect that a project would have on any given intersection would cause a potential CO hotspot. If the following criteria are met by the proposed project at all affected intersections, the proposed project would not be expected to result in a CO hotspot:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans;
- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; and
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, underpass, etc.).

The East County Action Plan includes several adopted traffic management plans and programs for selected arterials in East Contra Costa County. The proposed project's traffic-related impacts in comparison with such plans and other regulations are discussed in further detail in the Chapter 4.9, Transportation, Traffic, and Circulation of this EIR. As discussed in the chapter, the project would not significantly increase delay under existing or cumulative conditions in excess of the criteria specified in the East County Action Plan. In addition, the project would not conflict with or obstruct implementation of any applicably congestion management program. Thus, overall, the proposed project would be considered to be consistent with applicable congestion management programs or transportation plans.

According to the Transportation Impact Analysis prepared for the proposed project, the maximum traffic volume anticipated at an affected intersection would be about 4,000 vehicles per hour (with the James Donlon Boulevard Extension in place), which would occur at the intersection of Somersville Road and Buchanan Road during the PM peak hour under cumulative conditions. It should be noted that that traffic consultant analyzed the project intersections with and without the James Donlon Boulevard Extension in place. Without the James Donlon Boulevard Extension in place, the intersection of Somersville Road and Buchanan Road would experience 4,400 vehicles per hour during the PM peak hour under cumulative conditions. As such, the maximum volume of traffic anticipated at an affected intersection as a result of the proposed project would be below the 44,000 vehicles per hour, or 24,000 vehicles per hour where mixing is limited,

screening criteria established by the BAAQMD. Therefore, the proposed project would not be expected to result in substantial levels of localized CO at surrounding intersections or generate localized concentrations of CO that would exceed standards.

TAC Emissions

Another category of environmental concern is TACs. Typically, the sources of TACs of concern are any sources located within 1,000 feet of a sensitive receptor or proposed project site. The CARB has identified DPM from diesel-fueled engines as a TAC; thus, high volume freeways, stationary diesel engines, such as construction equipment, and facilities attracting heavy and constant diesel vehicle traffic are identified as having the highest associated health risks from DPM. According to the Health Risk Assessment prepared for the proposed project, Buchanan Road, Somersville Road, and one nearby stationary source are the only sources of TAC emissions identified within 1,000 feet of the project site with the potential to cause health risk impacts. In addition, the proposed project's construction-related emissions of TACs were evaluated at the nearest existing sensitive receptors. It should be noted that the proposed project, being a residential development, would not involve long-term operation of any stationary diesel engine or other major on-site stationary source of TACs.

Buchanan Road and Somersville Road

For roadways, BAAQMD has published screening tables and data to determine if roadways with traffic volumes of over 10,000 vehicles per day may have a significant effect on a proposed project.

In the vicinity of the project area, Buchanan Road and Somersville Road were calculated to have more than 10,000 average daily traffic (ADT) under the Cumulative Plus Project with Bypass condition using data supplied by the project traffic consultant. The PM peak hour volume for Buchanan Road consisted of more trips than during the AM peak hour; thus, the PM peak hour volume of 2,433 vehicles was utilized for analysis of TAC emissions. In addition, the ADT in the project area was assumed to be approximately ten times that of peak hour volume, or 24,330 ADT. For Somersville Road, the PM peak hour volume of 2,000 vehicles was used to estimate an ADT of 20,000. Other local roadways with high traffic volumes are not located close to the project site.

Using the BAAQMD roadway screening analysis table for Contra Costa County, cancer risk at a distance of 10 feet from the roadways would be 3.2 in one million for Buchanan Road and 3.4 in one million for Somersville Road, and $PM_{2.5}$ concentrations would be 0.1 $\mu g/m^3$ for both roadways. Thus, according to the screening analysis, both roadways would have a cancer risk of less than 10 in one million and $PM_{2.5}$ concentrations below 0.3 $\mu g/m^3$. In addition, according to the Health Risk Assessment, the hazard index for both roadways would be well below the threshold of 1.0. Therefore, sensitive receptors at the proposed project site would not be exposed to substantial levels of TACs from local roadways.

Stationary Sources

As part of the Health Risk Assessment, stationary sources that emit TACs were searched using the BAAQMD Google Earth Stationary Source Screening Analysis Tool. One source within 1,000 of the project site was identified, which was the Chevron Pipeline Company located at 2360 Buchanan Road, adjacent to the project site. It should be noted that the Chevron parcel is included in the annexation, but is not slated for development as part of this project. BAAQMD reports the source level of cancer risk, hazard index, and $PM_{2.5}$ concentration for the source. According to BAAQMD, the source was reported to have a screening cancer risk of below 10 in one million, as well as a reported $PM_{2.5}$ concentration and hazard index well below the applicable thresholds of significance (see the Health Risk Assessment in Appendix D). Therefore, sensitive receptors at the proposed project site would not be exposed to substantial levels of TACs from the nearby stationary source.

Project Construction

The Health Risk Assessment prepared for the proposed project conducted an evaluation of the potential health effects associated with construction-related emissions of DPM of sensitive receptors at the nearest residences to the project site. The USEPA's ISCST3 dispersion model was used to predict the off-site DPM and $PM_{2.5}$ concentrations resulting from project construction, so that lifetime cancer risks could be predicted. Figure 4.1-1 shows the project site and sensitive receptor locations (residences) where potential health impacts were evaluated. According to the Health Risk Assessment, the maximum increased cancer risk, based on a conservative estimate of initial exposure as an infant, was estimated to be 15.8 in one million, which would occur at an off-site residence along the southern property boundary next to construction area 6 (see Figure 4.1-1) with exposure beginning in 2025. The increase in cancer risk would be greater than the applicable threshold of significance of an increase in cancer risk of 10 in one million.

Potential non-cancer health effects due to chronic exposure to DPM were also evaluated. The maximum predicted annual DPM concentration was 0.14 $\mu g/m^3$, which is lower than the chronic inhalation reference exposure level (REL) for DPM of 5 $\mu g/m^3$. The hazard index, which is the ratio of the annual DPM concentration to the REL, is 0.03, which is lower than the applicable threshold of significance of 1.0. In addition, the maximum annual $PM_{2.5}$ concentration, which includes both $PM_{2.5}$ exhaust and fugitive dust, was estimated to be 0.22 $\mu g/m^3$, which would occur at the same location as where the maximum cancer risk would occur. The estimated $PM_{2.5}$ concentration would be below the applicable threshold of significance of 0.3 $\mu g/m^3$ annual average $PM_{2.5}$.

Because the proposed project would result in an increase in cancer risk greater than the applicable threshold of significance, nearby sensitive receptors could be exposed to levels of TACs associated with construction activities that would be considered substantial.

Figure 4.1-1
Project Site, Construction Areas, and Off-Site Residential Receptor Locations

Source: Illingworth & Rodkin, Inc, Tuscany Meadows Community Health Risk Assessment, March 31, 2014.

Conclusion

The proposed project would not be expected to result in localized CO concentrations that would exceed standards and would not expose sensitive receptors to such. In addition, future sensitive receptors on-site would not be exposed to substantial levels of pollutant concentrations associated with existing or future sources, including roadway traffic and nearby stationary sources. Furthermore, the project would not involve long-term operation of any stationary diesel engine or other major on-site stationary source of TACs, and, thus, would not expose existing or future sensitive receptors to emissions associated with such operational sources. However, construction of the proposed project could result in emissions that would cause an increase in cancer risk in excess of the applicable threshold of significance at nearby existing residential locations. It should be noted that the proposed project is required to implement all of the Basic Construction Mitigation Measures provided in the BAAQMD CEQA Guidelines, as discussed and presented above, which would help to reduce emissions of construction-related TAC emissions. Nonetheless, the proposed project could result in a ***potentially significant*** impact associated with exposure of sensitive receptors to substantial levels of pollutant concentrations.

Mitigation Measure(s)

Implementation of the following mitigation measures, in conjunction with the required BAAQMD Basic Construction Mitigation Measures, would reduce the increase in cancer risk associated with construction-related TAC emissions from 15.8 in one million to 8.0 in one million, which would be below the applicable threshold of significance of 10 in one million. Therefore, implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

4.1-3(a) *Implement Mitigation Measure 4.1-1(a); or the construction contractor shall use other measures to minimize construction period DPM emissions sufficient to reduce the predicted cancer risk below the applicable threshold of significance of 10 in one million. Such measures may include the use of alternative-powered equipment (e.g., LPG-powered forklifts), alternative fuels, added exhaust devices, or a combination of measures, provided that the measures are approved by the City Engineer. Verification that the chosen measures are sufficient to reduce cancer risk to below the applicable threshold of significance shall be provided to the City Engineer by the project proponent prior to issuance of a grading permit for each phase of construction for the Tuscany Meadows subdivision.*

4.1-3(b) *During any construction period ground disturbance of Areas 4 through 11 (as shown in Figure 4.1-1), the project applicant shall show on the grading plans via notation that the contractor shall ensure that 40 percent of all diesel-powered equipment larger than 50 horsepower and operating on the site for more than two days consecutively shall meet USEPA particulate matter emissions standards for Tier 4 engines or equivalent.*

The grading plans shall be submitted for review and approval by the City Engineer prior to issuance of grading permits for each phase of construction. The construction contractor shall use other measures to minimize construction period diesel particulate matter emissions to reduce the predicted cancer risk DPM emissions sufficient to reduce the predicted cancer risk below the applicable threshold of significance of 10 in one million. Such measures may include the use of alternative-powered equipment (e.g., LPG-powered forklifts), alternative fuels, added exhaust devices, or a combination of measures, provided that the measures are approved by the City Engineer prior to issuance of a grading permit for each phase of construction. Verification that the chosen measures are sufficient to reduce cancer risk to below the applicable threshold of significance shall be provided to the City Engineer by the project proponent prior to issuance of a grading permit for the Tuscany Meadows subdivision for each phase of construction.

4.1-3(c) *Implement Mitigation Measure 4.1-1(b).*

4.1-3(d) *Prior to issuance of a grading permit for each phase of construction for the Tuscany Meadows subdivision, the project applicant shall show on the grading plans via notation that the contractor shall minimize the number of minutes that equipment will operate. The idling time of diesel powered construction equipment shall be minimized to two minutes, per the Additional Construction Mitigation Measures recommended by BAAQMD. The grading plans shall be submitted for review and approval by the City Engineer.*

Cumulative Impacts and Mitigation Measures

As defined in Section 15355 of the CEQA Guidelines, "cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects.

A project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects. The geographic context for the proposed project cumulative air quality analysis includes the City of Pittsburg and surrounding areas within the SFBAAB that is designated nonattainment for ozone and PM.

Global climate change is, by nature, a cumulative impact. Emissions of GHG contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change (e.g., sea level rise, impacts to water supply and water quality, public health impacts, impacts to ecosystems, impacts to agriculture, and other environmental impacts). A single project could not generate enough GHG emissions to contribute noticeably to a change in the global average

temperature. However, the combination of GHG emissions from a project in combination with other past, present, and future projects contribute substantially to the world-wide phenomenon of global climate change and the associated environmental impacts. Although the geographical context for global climate change is the Earth, for analysis purposes under CEQA and due to the regulatory context pertaining to GHG emissions and global climate change applicable to the proposed project, the geographical context for global climate change in this EIR is limited to the State of California.

For the purposes of the impact analysis, the James Donlon Extension (JDE) is assumed to be in place under the Cumulative Conditions. The JDE is a planned and partially funded project included in the County's Regional Transportation Plan.

4.1-4 Cumulative emissions of criteria air pollutants. Based on the analysis below, even with implementation of mitigation, the impact is *significant and unavoidable*.

The long-term emissions associated with operation of the proposed project in conjunction with other existing or planned development in the area would incrementally contribute to the region's exceedance of air quality thresholds. The BAAQMD has established cumulative thresholds for emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$. The proposed project's contribution to cumulative emissions of criteria air pollutants were calculated using CalEEMod and are presented in Table 4.1-12.

Table 4.1-12
Unmitigated Project Cumulative Emissions (tons/yr)

	ROG	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Proposed Project	18.74	8.07	9.04	3.68
BAAQMD Thresholds	10	10	15	10
Exceed Thresholds?	**YES**	**NO**	**NO**	**NO**

Source: CalEEMod, June 2014 (see Appendix E).

As shown in the table, the proposed project's cumulative emissions of ROG would exceed the BAAQMD cumulative threshold of significance. Therefore, the proposed project's incremental contribution to cumulative air quality impacts would be considered ***significant***.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the project's cumulative emissions as shown in Table 4.1-13 below. As shown in the table, the cumulative emissions of ROG would still exceed the applicable threshold of significance. The majority of ROG emissions associated with the proposed project are from consumer products (e.g., deodorants, cleaning products, spray paint, aerosols, etc.). Potential measures that could be applied to reduce operational ROG emissions include providing electrical outlets on the outside of the proposed homes to encourage the use of electric landscaping equipment, limiting the VOC content beyond regulatory requirements of consumer products used in the proposed homes, or monitoring the use of consumer products in the proposed homes. Although such measures would reduce the overall

operational ROG emissions associated with the proposed project, such measures cannot be enforced or regulated in any manner that would ensure a reduction of ROG emission to below the applicable threshold of significance. Nonetheless, some of the aforementioned measures to reduce operational ROG emissions are included in Mitigation Measures 4.1-2(a), 4.1-2(b), 4.1-2(c), and 4.1-2(d). Because further feasible mitigation measures do not exist that would ensure reduction of operational ROG emissions to below the applicable threshold of significance, the above impact would remain *significant and unavoidable*.

Table 4.1-13
Mitigated Project Cumulative Emissions (tons/yr)

	ROG	NO_X	PM_{10}	$PM_{2.5}$
Proposed Project	12.47	7.95	7.64	2.28
BAAQMD Thresholds	10	10	15	10
Exceed Thresholds?	**YES**	**NO**	**NO**	**NO**

Source: CalEEMod, June 2014 (see Appendix E).

4.1-4 Implement Mitigation Measure 4.1-2.

4.1-5 Cumulative emissions of TACs. Based on the analysis below, the impact is *less than significant.*

Cumulative impacts associated with the exposure of the on-site sensitive receptors associated with the proposed project to nearby sources of TACs were evaluated in the Health Risk Assessment prepared for the proposed project. The cancer risk, hazard index, and $PM_{2.5}$ concentrations from each nearby source were added together and compared to the BAAQMD Community Risk significance thresholds for cumulative sources. Table 4.1-14 below shows the estimated increase in community risk from each source on the proposed sensitive receptors. As shown in the table, the estimated cumulative risk would be well below the applicable thresholds of significance. Therefore, a ***less-than-significant*** cumulative impact associated with exposure of sensitive receptors to TAC concentrations would occur.

Table 4.1-14
Cumulative Health Risk at Proposed Project Site

Distance from Receptor (feet)	Plant No.	Facility Name	Street Address	Cancer Risk (per million)	Hazard Index	$PM_{2.5}$ ($\mu g/m^3$)
10	Buchanan Road			3.2	<0.02	0.1
10	Somersville Road			2.4	<0.02	0.1
10	247	Chevron Pipeline Company	2360 Buchanan Road	0.0	0.0	.0.
TOTAL				**5.6**	**<0.05**	**0.2**
BAAQMD Thresholds				**100**	**10.0**	**0.8**

Source: Illingworth & Rodkin, Inc, Tuscany Meadows Community Health Risk Assessment, March 31, 2014 (see Appendix D).

Mitigation Measure(s)
None required.

4.1-6 Emissions of GHGs and contribution to global climate change. Based on the analysis below, the impact is *less than significant*.

An individual project's GHG emissions are at a micro-scale level relative to global emissions and effects to global climate change; however, an individual project could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. As such, impacts related to emissions of GHG are inherently considered cumulative impacts.

Implementation of the proposed project would cumulatively contribute to increases of GHG emissions that are associated with global climate change. Estimated GHG emissions attributable to future development would be primarily associated with increases of CO_2 and, to a lesser extent, other GHG pollutants, such as CH_4 and N_2O. Sources of GHG emissions include area sources, mobile sources or vehicles, utilities (electricity and natural gas), water usage, wastewater generation, and the generation of solid waste.

Construction GHG emissions are a one-time release and are, therefore, not typically expected to generate a significant contribution to global climate change. Neither the City nor BAAQMD has an adopted threshold of significance for construction-related GHG emissions and does not require quantification. Nonetheless, the proposed project's construction GHG emissions have been amortized over the anticipated construction phase of the proposed project, which is assumed to be 15 years for this analysis, and included in the annual operational GHG emissions for discretionary purposes.[18] Utilizing the CalEEMod modeling software, the total annual construction-related GHG emissions were estimated to be 484.65 $MTCO_2e$, or 32.31 $MTCO_2e$ per year over the 15-year construction phase

The proposed project's GHG emission estimations were conducted using CalEEMod. Utilizing CalEEMod and taking into account construction-related emissions, the proposed project's total GHG emissions were estimated and are presented in Table 4.1-15. It should be noted that the proposed project's inherent site and sustainability features have been applied to the modeling, including the project's density, proximity to existing transit stations, and bicycle and pedestrian connection improvements. In addition, compliance with the applicable BAAQMD rules and regulations as noted above have been included in the modeling such as use of only low VOC paints. The project's service population was estimated to be 3,975, based on 3.1 persons per household from the City of Pittsburg General Plan Land Use Element.

Table 4.1-15 Unmitigated Project GHG Emissions	
	Annual GHG Emissions
Operational GHG Emissions	12,209.35 $MTCO_2e$/yr
Construction-Related GHG Emissions[1]	32.31 $MTCO_2e$/yr
Total Annual GHG Emissions	12,241.66 $MTCO_2e$/yr
Total Annual Project GHG Emissions Per Service Population[2]	**3.08 $MTCO_2e$/SP/yr**
BAAQMD Threshold	4.6 $MTCO_2e$/SP/yr
Exceeds Threshold?	**NO**

[1] Total annual construction-related GHG emissions of 484.65 $MTCO_2e$/yr amortized over the 15-year construction phase

[2] Service population for project calculated to be 3,975 based on 3.1 persons per household.

Source: CalEEMod, June 2014 (see Appendix E).

As shown in the above table, the project's total unmitigated annual GHG emissions, including construction-related emissions, were estimated to be approximately 3.08 $MTCO_2e$ per service population per year, which is below the BAAQMD threshold of significance for GHG emissions. It should be noted that the actual annual GHG emissions of the proposed project would be less than presented in Table 4.1-15, due to the one-time release of construction-related GHG emissions and implementation of the mitigation measures prescribed throughout this chapter. Because the project's unmitigated annual GHG emissions would be below the 4.6 $MTCO_2e$ per service population per year threshold utilized by the City, the proposed project would be considered to result in a ***less-than-significant*** cumulative impact related to GHG emissions and global climate change.

Mitigation Measure(s)
None required.

Endnotes

[1] Bay Area Air Quality Management District. *California Environmental Quality Act Air Quality Guidelines.* May 2011.
[2] City of Pittsburg. General Plan: "*Pittsburg 2020: A Vision for the 21st Century*." Adopted November 16, 2001.
[3] City of Pittsburg. *City of Pittsburg General Plan Draft Environmental Impact Report*. January 2001.
[4] Illingworth & Rodkin, Inc. *Tuscany Meadows Community Health Risk Assessment*. March 31, 2014.
[5] ENVIRON International Corporation and the California Air Districts. *California Emissions Estimator Model User's Guide Version 2013.2*. July 2013.
[6] California Air Resources Board. Glossary of Air Pollution Terms. Available at: http://www.arb.ca.gov/html/gloss.htm. Accessed October 2013.
[7] Bay Area Air Quality Management District. Air Quality Standards and Attainment Status. Available at: http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm. Accessed October 2013.
[8] Bay Area Air Quality Management District. Air Quality Plans. Available at: http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans.aspx. Accessed April 14, 2014.
[9] Ibid.
[10] *Ibid.*
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[15] California Air Resources Board. *Status of Scoping Plan Recommended Measures*. Available at: http//www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf. Accessed April 2014.
[16] City of Pittsburg. *Development Review Design Guidelines, Section VI: Green Building Design Guidelines.* Adopted November 9, 2010.
[17] University of California, Davis. *Transportation Project-Level Carbon Monoxide Protocol*. December 1997.
[18] The BAAQMD does not recommend any specific operational lifetimes for use in amortizating construction-related GHG emissions; however, the SMAQMD, per its *Guide to Air Quality Assessment in Sacramento County*, suggests an operational lifetime for a new residential building of 40 years. The estimates are derived from the State of California Executive Order D-16-00 and US Green Building Council's October 2003 report on *The Costs and Financial Benefits of Green Buildings*.