4.3 AIR QUALITY

This Section describes existing conditions, potential Project-related impacts, and proposed mitigation measures for air quality and climate change issues in the Project area. Included are descriptions of the environmental setting in terms of existing air quality that could be affected by the proposed alignment. Federal, State, and local regulations that could affect the Project construction and operation are discussed followed by discussions of impacts and mitigation measures, organized by each of the significance criteria identified.

4.3.1 Environmental Setting

Regional Air Quality

The proposed Project would be located in the lower Sacramento Valley and traverse Yolo, Sutter, Sacramento, and Placer counties. The pipeline would originate in Yolo County, just west of Yolo County Road (CR) 85, and extend approximately 40 miles east to Placer County, terminating at the intersection of Fiddyment Road and Baseline Road, adjacent to the City of Roseville.

The Project area is located within the Sacramento Valley Air Basin (SVAB), a large north-south oriented valley in Northern California. The SVAB is bounded by the Sierra Nevada Mountains to the east and the North Coast Ranges to the west, and extends from Shasta County to Sacramento County. The SVAB encompasses 11 counties, including Shasta, Tehama, Glenn, Colusa, Yolo, Butte, Yuba, Sutter, and Sacramento County. The SVAB also includes the northeastern half of Solano County and the western portion of Placer County. The SVAB is further divided into two planning areas: the Broader Sacramento Area that consists of the southern (more populated) portion of the SVAB, and the Upper Sacramento Valley. The Project is located in the Broader Sacramento Area portion of the SVAB.

The Project passes through the Yolo/Solano Air Quality Management District (YSAQMD), the Feather River Air Quality Management District (FRAQMD), the Placer County Air Pollution Control District (PCAPCD), and the Sacramento Metropolitan Air Quality Management District (SMAQMD). The local air districts in the Project area are illustrated in Figure 4.3-1.

Topography. The SVAB is generally shaped like a bowl. It is open in the south and is surrounded by mountain ranges on all other sides. The Sierra Nevada Mountains form the eastern border of SVAB, and the Coast Ranges are located along the western boundary of the SVAB.

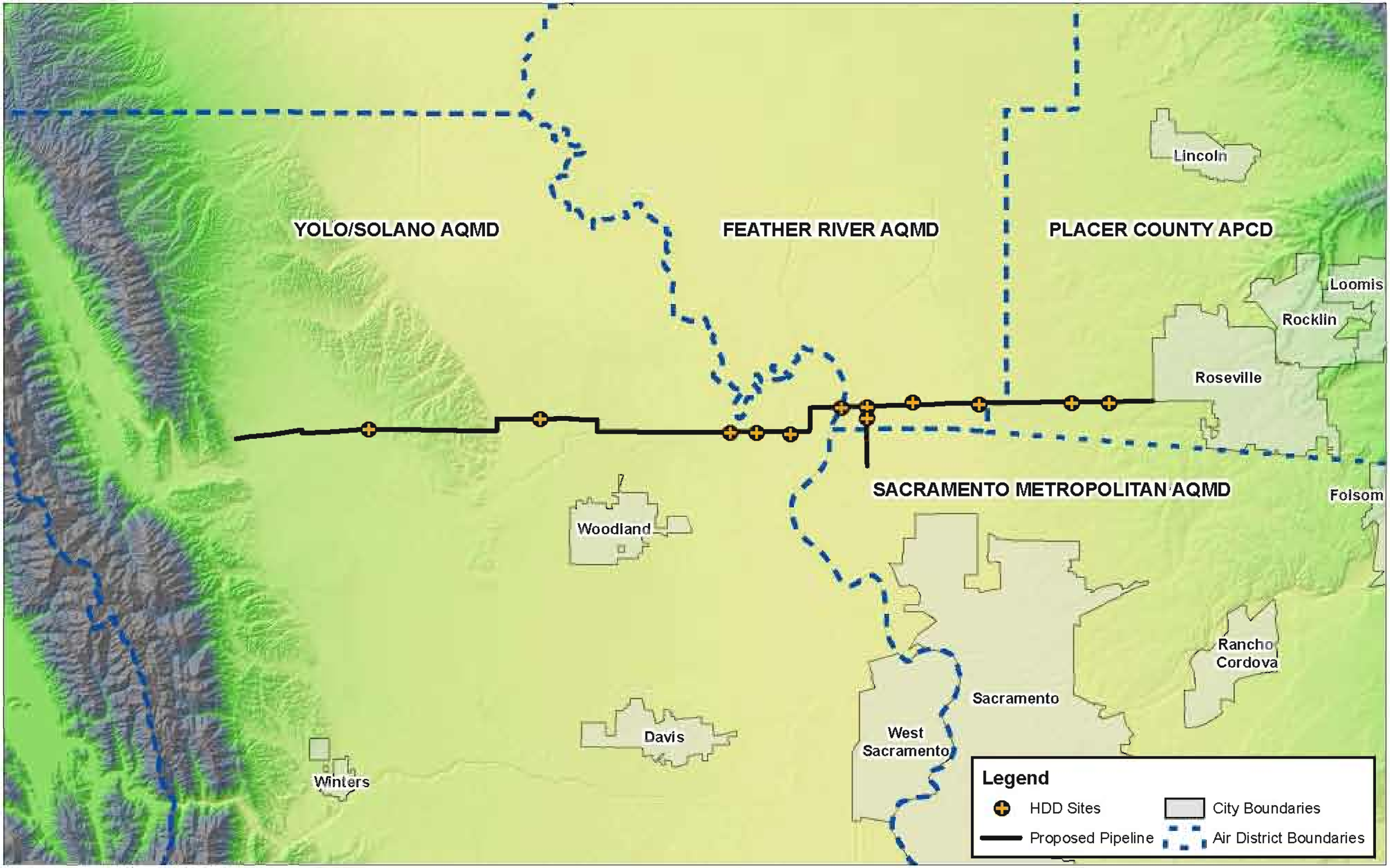
Meteorology. The lower Sacramento Valley region enjoys a Mediterranean climate with warm, dry summers and cool, mild winters. Summers are generally dry with hot afternoons and mild evening temperatures. Summer temperatures are influenced by the Delta Breeze that generally arrives in the afternoon and serves to moderate maximum temperatures. The rainy season begins in mid November and continues through March. Average annual total precipitation for the area is approximately 19.35 inches with the months of May through October each receiving less than an inch of precipitation (WWRC 2007). Winds prevail from the south and west, with the exception of November and December when winds are from the northwest. Approximate temperatures range from an average minimum of 37.6 degrees Fahrenheit (ºF) in January to an average maximum of 95.8 ºF in July (WWRC 2007).

Dominant Airflow. Dominant airflows provide the driving mechanism for transport and dispersion of air pollution. Summer patterns are dominated by the Delta Breeze that transports cool air inland from the Sacramento-San Joaquin Delta (Delta) south of the SVAB. The arrival and intensity of the Delta Breeze are key factors in air quality of the Sacramento Valley. Alternate flows include dry overland flows from the north end of the SVAB. Another prominent wind flow feature, the "Schultz Eddy," can influence air quality in the Project area. The Schultz Eddy is a counterclockwise circular eddy centered around the Sacramento, Woodland, and Davis area.

Transport. Transport is the term used to describe the flow of air pollutants from one geographic area to another. The Project area is considered both a contributor and recipient of transported air pollutants. The air quality in the Broader Sacramento Area can be impacted by ozone precursors generated in the San Francisco Bay Area, and on occasion, by pollutants transported from the San Joaquin Valley. However, local emissions dominate the inventory of air pollution on hot stagnant summer days. (CARB 2001).

Attainment Status

There are three terms used to describe an air basin that is exceeding or meeting Federal and State standards: Attainment, Nonattainment, and Unclassified. Air basins, or sub-parts of air basins, are assessed for each applicable standard, and receive a designation for each standard based on that assessment. If an ambient air



Source: Adapted from PG&E 2007, California Air Resources Board March 2004, USGS National Elevation Dataset .

Michael Brandman Associates

NORTH

0 2.5 5 10 Miles

Figure 4.3-1
Air Districts in the Project Region

quality standard is exceeded, the area is designated as **“**nonattainment**”** for that standard. An area is designated as an **“**attainment**”** area for standards that are met. If there is inadequate or inconclusive data to make a definitive attainment designation for an air quality standard, the area is considered **“**unclassified.**”** Federal nonattainment areas are further divided into classifications—classified as severe, serious, or moderate as a function of deviation from standards. The current attainment designations for the Project area are shown in Table 4.3-1 below.

Table 4.3-1: Attainment Status of Yolo, Sutter, Sacramento, and Placer Counties

Pollutant	**Yolo County**	**Sutter County**	**Sacramento County**	**Placer County[1]**
Federal				
Ozone (0_3)	Nonattainment	Nonattainment	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment
Nitrogen Dioxide (NO_2)	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment
Sulfur Dioxide (SO_2)	Unclassified	Unclassified	Unclassified	Unclassified
Particulate Matter (PM_{10})	Unclassified	Unclassified	Nonattainment	Unclassified
Particulate Matter ($PM_{2.5}$)	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment
State				
Ozone (0_3)	Nonattainment	Nonattainment	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Attainment	Attainment	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment	Attainment	Attainment
Particulate Matter (PM_{10})	Nonattainment	Nonattainment	Nonattainment	Nonattainment
Particulate Matter ($PM_{2.5}$)	Unclassified	Unclassified	Nonattainment	Nonattainment

Pollutant	Yolo County	Sutter County	Sacramento County	Placer County[1]
Notes [1] Placer County is divided between two air basins: the Mountain Counties Air Basin and the Sacramento Valley Air Basin. Attainment status listed in this table represents the portion of Placer County within the Sacramento Valley Air Basin, where the proposed Project is located. Source: CARB 2008.				

The counties in which the Project is located are classified as nonattainment for the Federal 1-hour ozone standard. However, the United States Environmental Protection Agency (EPA) revoked the Federal 1-hour ozone standard on June 15, 2005, replacing it with the more stringent 8-hour ozone standard. However, the local air districts are still subject to continuation of existing 1-hour ozone control strategies.

Under the new Federal 8-hour standard, the counties where the Project is located are classified as serious nonattainment and identified as the Sacramento Federal Nonattainment Area. The Federal 8-hour ozone attainment deadline for the Sacramento Federal Nonattainment Area is June 15, 2013. Additionally, the counties are designated as nonattainment for both the 1-hour and 8-hour State ozone standards.

The counties in which the Project is located are designated as unclassified/attainment under the Federal standards for carbon monoxide (CO). However, portions of Placer County, Sacramento County and Yolo County had previously been nonattainment for the Federal CO standard. The counties have since attained the standard and are listed as maintenance areas for the Federal CO standard. Under State standards the counties are designated as attainment for CO.

Under Federal standards, Yolo, Sutter, and Placer Counties are unclassified for particulate matter (less than 10 microns [PM_{10}]). Sacramento County is currently designated nonattainment of the Federal PM_{10} standard. However, current data shows that Sacramento County has attained the standard although the county will not be redesignated until the EPA officially publishes the county's designation as attainment.

In addition, all the counties are designated nonattainment for the State PM_{10} standard. Sacramento County is designated nonattainment for the State particulate matter (less than 2.5 microns [$PM_{2.5}$]) standard.

Pollutants of Concern

As described above, the Project area is designated nonattainment for the Federal and State 8-hour ozone standards. In addition, the area is nonattainment for the State 1-hour ozone, 24-hour and annual PM_{10}, and annual $PM_{2.5}$ standards. Because the area exceeds these health-based ambient air quality standards, ozone, PM_{10} and $PM_{2.5}$ are the main criteria pollutants of concern for the Project area. In addition, CO is a pollutant of concern due to the localized nature of CO hot spots (see discussion below under Toxic Air Contaminant Regulation). Other pollutants of concern are toxic air contaminants and greenhouse gases (GHGs).

The proposed Project is not expected to produce air emissions containing hydrogen sulfide, sulfates, and vinyl chloride. Therefore, these pollutants will not be discussed.

The emissions sources and potential health effects of the pollutants of concern are described below.

Pollutant Descriptions

Ozone. Ozone is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. The ozone precursors reactive organic gases (ROG) and oxides of nitrogen (NO_x) react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summertime air pollution problem. Often, ozone impacts occur at a distance downwind of the sources of ozone precursors. Therefore, ozone is a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials.

Ozone can irritate lung airways and cause inflammation much like a sunburn. Other symptoms include wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities. People with respiratory problems are most vulnerable, but even healthy people who are active outdoors can be affected when ozone levels are high. Chronic ozone exposure can induce morphological (tissue) changes throughout the respiratory tract, particularly at the junction of the conducting airways and the gas exchange zone in the deep lung. Anyone who spends time outdoors in the summer is at risk, particularly children and other people who are more active outdoors. Even at very low levels, ground-level ozone triggers a variety of health problems, including aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis.

Ozone also damages vegetation and ecosystems. It leads to reduced agricultural crop and commercial forest yields; reduced growth and survivability of tree seedlings; and increased susceptibility to diseases, pests, and other stresses such as harsh weather. In the United States alone, ozone is responsible for an estimated $500 million in reduced crop production each year. Ozone also damages the foliage of trees and other plants, affecting the landscape of cities, national parks and forests, and recreation areas. In addition, ozone causes damage to buildings, rubber, and some plastics.

Reactive Organic Gases. ROGs, also known as volatile organic compounds (VOCs), are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participate in atmospheric photochemical reactions. ROGs consist of nonmethane hydrocarbons and oxygenated hydrocarbons. Hydrocarbons are organic compounds that contain only hydrogen and carbon atoms. Nonmethane hydrocarbons are hydrocarbons that do not contain the unreactive hydrocarbon methane. Oxygenated hydrocarbons are hydrocarbons with oxygenated functional groups attached.

There are no State or Federal ambient air quality standards for ROGs because they are not classified as criteria pollutants. ROG is regulated, however, because a reduction in ROG emissions reduces certain chemical reactions that contribute to the formulation of ozone. ROGs are also transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} levels and lower visibility.

Nitrogen Oxides. During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides or NO_x. This occurs primarily in motor vehicle internal combustion engines and fossil fuel-fired electric utility facilities and industrial boilers. The pollutant NO_x is a concern because it is an ozone precursor, which means that it helps form ozone. When NO_x and ROG are released in the atmosphere, they can chemically react with one another in the presence of sunlight and heat to form ozone. NO_x can also be a precursor to PM_{10} and $PM_{2.5}$.

Particulate Matter (PM_{10} and $PM_{2.5}$). Particulate matter (PM) is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope.

In discussions of air pollution, particulate matter is typically divided into two size categories: PM_{10} and $PM_{2.5}$ because of the adverse health effects associated with the smaller sized particles. PM_{10} refers to particulate matter that is 10 microns or less in diameter (1 micron is one-millionth of a meter) and is conventionally known as Inhalable Particulate Matter. $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter and is conventionally known as Fine Particulate Matter. For reference, $PM_{2.5}$ is approximately one-thirtieth the diameter of the average human hair.

These particles come in many sizes and shapes and can consist of hundreds of different chemicals. Some particles, known as primary particles, are emitted directly from a source, such as dust from construction sites, unpaved roads, or fields, and soot or ash from smokestacks or fires. Others form in complicated reactions in the atmosphere from chemicals such as sulfur dioxides and nitrogen oxides that are emitted from sources such as power plants, industrial activity, and automobiles. These particles, known as secondary particles, make up most of the fine particulate pollution in the United States.

Particulate exposure can lead to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits—and even to death from heart or lung diseases. Both long- and short-term particle exposures have been linked to health problems. Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function, the development of chronic bronchitis, and even premature death. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not reported to suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated.

Carbon Monoxide. CO is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. Other non-road engines and vehicles (such as construction equipment and boats) contribute about

22 percent of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential woodburning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO indoors.

CO is a public health concern because it combines readily with hemoglobin, reducing the amount of oxygen transported in the bloodstream. The health threat from lower levels of CO is most serious for those who suffer from such heart-related diseases as angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can be fatal.

Motor vehicles are the dominant source of CO emissions in most areas. CO is described as having only a local influence because it disperses quickly. High CO levels develop primarily during winter because emissions are higher with colder temperatures and low dispersion rates associated with light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). High CO concentrations occur in areas of limited geographic size, sometimes referred to as hot spots. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high traffic volumes and traffic congestion, active parking lots, and in automobile tunnels. Areas adjacent to heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

Toxic Air Contaminants. A toxic air contaminant (TAC) is defined as an air pollutant which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air. However, their high toxicity or health risk may pose a threat to public health even at very low concentrations. In general, for those TACs that may cause cancer, any concentration presents some risk. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the State and Federal governments have set ambient air quality standards.

TACs can be emitted from a variety of common sources, including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. Natural source emissions include windblown dust and wildfires. Farms, construction sites, and residential areas can also contribute to toxic air emissions. The California Air Resources Board (CARB) has identified the ten TACs that pose the greatest known health risk in California as: acetaldehyde, benzene, 1,3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and diesel particulate matter (diesel PM).

Diesel Particulate Matter. According to the California Almanac of Emissions and Air Quality, the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines (DPM). DPM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although DPM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TACs, no ambient monitoring data are available for DPM because no routine measurement method currently exists (CARB 2008b).

The State, after a 10-year research program, determined in 1998 (CARB 1998) that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic health risk. In addition to increasing the risk of lung cancer, exposure to diesel exhaust can have other health effects as well. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and can cause coughs, headaches, light-headedness, and nausea. Diesel exhaust is a major source of fine particulate pollution as well and studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks and premature deaths among those suffering from respiratory problems (CARB 1998).

In California, on-road diesel-fueled vehicles contribute approximately 40 percent of the statewide total of DPM, with an additional 57 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. Stationary sources, contributing about 3 percent of emissions, include shipyards, warehouses, heavy equipment repair yards, and oil and gas production operations. Emissions from these sources are from diesel-fueled internal combustion engines. Stationary sources that report diesel PM emissions also include heavy construction (except highway) manufacturers of asphalt paving materials and blocks, and electrical generation.

In the SVAB, in 2000, the estimated health risk from diesel PM was 360 excess cancer cases per million people. However, the estimated health risk in 2000 is a reduction from the risks estimated for 1990 (CARB 2008b).

Naturally Occurring Asbestos. Naturally occurring asbestos (NOA) is present in certain rock formations such as serpentinite and/or ultramafic rocks. Crushing or breaking these rocks, through construction or other means, can release the asbestos fibers into the air. Rock formations that contain NOA are known to be present in 44 of California's 58 counties. Exposure to asbestos is a health threat; exposure to asbestos fibers may result in health issues such as lung cancer, mesothelioma (a rare cancer of the thin membranes lining the lungs, chest and abdominal cavity), and asbestosis (a non-cancerous lung disease which causes scarring of the lungs).

Greenhouse Gases (**GHGs**)**.** Gases that trap heat in the atmosphere are GHGs, analogous to the way a greenhouse retains heat. The accumulation of GHGs in the atmosphere regulates the earth's temperature to be suitable for life. However, human activities have increased the amount of GHGs in the atmosphere. Some GHGs can remain in the atmosphere for hundreds of years. The following GHGs are defined under Assembly Bill (AB) 32: carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

The term "global warming potential" is the potential of a gas to contribute to global warming; it is based on a reference scale with carbon dioxide at one. Some pollutants are more potent than carbon dioxide, which is reflected by a higher global warming potential. The following is a brief description of the most common GHGs that may be emitted by the Project.

Carbon Dioxide. Carbon dioxide (CO_2) is an odorless, colorless natural GHG. CO_2 is emitted from natural and anthropogenic (human-caused) sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood. CO_2 has a global warming potential of one.

Methane. Methane is a flammable GHG. A natural source of methane is from the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain methane, which is extracted for fuel. Other sources include landfills, fermentation of manure, and ruminants such as cattle. Methane has a global warming potential of 21, meaning that a molecule of methane has 21 times the global warming potential of a molecule of CO_2.

Nitrous Oxide. Nitrous oxide, also known as laughing gas, is a colorless GHG. Nitrous oxide is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. Nitrous oxide is a highly potent GHG with a global warming potential of 310.

Regional Sources of Air Pollutants

According to the CARB's 2008 Almanac of Emissions and Air Quality (CARB 2008b), on-road motor vehicles are the primary source of emissions in Broader Sacramento Area/Sacramento Metropolitan Area, contributing the largest share of NO_X, ROG, and CO. Emissions of ROG, NO_X, and CO have been decreasing since 1990, due to controls on motor vehicle emissions and reductions in evaporative emissions.

The PM_{10} inventory for the SVAB is dominated by areawide sources, primarily by emissions of fugitive dust from paved and unpaved roads, farming operations, construction, and demolition, and particulates from residential fuel combustion. Overall, PM_{10} emissions have been steadily increasing in the SVAB since 1975.

Area-wide sources also contribute the majority of $PM_{2.5}$ emissions in the SVAB, with fugitive dust from paved and unpaved road, construction, and demolition, and particulates from residential fuel combustion and waste burning generating the majority of the inventory. The $PM_{2.5}$ emissions have remained relatively steady from 1975 to 2005, but are estimated to increase slightly between 2005 and 2020.

Local Air Quality

Topography. Topography along the Project area consists of a combination of flat to undulating and rolling hills with corresponding elevations ranging from approximately 15 to 255 feet above mean sea level (msl) (PG&E 2007). The mountains to the east, west, and north enclose the valley and can trap air pollutants and contaminants, elevating ambient concentrations.

Air Monitoring Data. Existing air quality for the Project setting is described using data from the CARB's monitoring stations. The stations described here are located in proximity to the Project site in three of the four counties (Yolo, Sacramento, and

Placer) through which the pipeline traverses. Air monitoring stations within Sutter County are more than 25 miles from the Project area and therefore were not included in this discussion. The most centrally located ambient air monitoring station to the Project area is at 41929 East Gibson Road in Woodland, approximately 5 miles south of the western end of Line 407 West in Yolo County. This station collects data for ozone, $PM_{2.5}$, and PM_{10}. Within Sacramento County, the closest monitoring station to the Project area is the North Highland-Blackfoot Way station located at 7823 Blackfoot Way in North Highlands, approximately 2.7 miles south of the eastern portion of Line 407 East. This station collects data for ozone, PM_{10}, CO, NO_2, and SO_2. Within Placer County, the Roseville North Sunrise Boulevard station is located at 151 North Sunrise Boulevard in Roseville and is approximately 5 miles east of the eastern extent of the Project area. This station collects data for ozone, PM_{10}, $PM_{2.5}$, CO, and NO_2. Table 4.3-2 summarizes the latest published monitoring data for these stations and compares them to California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).

Table 4.3-2: Project Area Air Quality Summary - 2005 through 2007

County/Pollutant / Monitoring Station		2005	2006	2007
Ozone - 1 Hour				
Yolo	Max 1 Hour (ppm) Days > CAAQS (0.09 ppm)	0.099 2	0.106 6	0.106 1
Sacramento	Max 1 Hour (ppm) Days > CAAQS (0.09 ppm)	0.103 3	0.135 15	0.109 1
Placer	Max 1 Hour (ppm) Days > CAAQS (0.09 ppm)	0.118 13	0.121 16	0.109 4
Ozone - 8 Hour				
Yolo	Max 8 Hour (ppm)[1] Days > CAAQS (0.07 ppm) Days > NAAQS (0.08 ppm)	0.086 13 2	0.091 23 4	0.078 5 0
Sacramento	Max 8 Hour (ppm)[1] Days > CAAQS (0.07 ppm) Days > NAAQS (0.08 ppm)	0.086 11 2	0.093 42 10	0.096 4 1
Placer	Max 8 Hour (ppm)[1] Days > CAAQS (0.07 ppm) Days > NAAQS (0.08 ppm)	0.106 27 9	0.098 38 9	0.101 20 3

County/Pollutant / Monitoring Station		2005	2006	2007
Particulate Matter (PM_{10})				
Yolo	National Annual Average (µg/m3) Max 24 Hour (µg/m^3)[1] Days > CAAQS (50 µg/m^3) Days > NAAQS (150 µg/m^3)	23.7 66.0 1 0	25.1 78.0 6 0	25.2 119.0 3 0
Sacramento	National Annual Average (µg/m3) Max 24 Hour (µg/m^3)[1] Days > CAAQS (50 µg/m^3) Days > NAAQS (150 µg/m^3)	27.2 109.0 7 0	25.9 67.0 3 0	24.0 59.0 2 0
Placer	National Annual Average (µg/m3) Max 24 Hour (µg/m^3)[1] Days > CAAQS (50 µg/m^3) Days > NAAQS (150 µg/m^3)	19.1 58.0 1 0	22.0 55.0 1 0	17.0 45.0 0 0
Particulate Matter ($PM_{2.5}$) - Annual				
Yolo	National Annual Average (50 µg/m^3)	8.4	9.3	8.3
Placer	National Annual Average (50 µg/m^3)	10.0	10.5	8.4
Particulate Matter ($PM_{2.5}$) - Daily				
Yolo	Max 24 Hour (µg/m^3)[1] Days> NAAQS (35 µg/m^3)	35.0 0	44.0 0	42.0 0
Placer	Max 24 Hour (µg/m3)[1] Days> NAAQS (35 µg/m^3)	59.2 0	54.7 0	48.7 0
Carbon Monoxide				
Sacramento	Max 8 Hour (ppm)[1] Days > CAAQS (20 ppm) Days > NAAQS (35 ppm)	2.86 0 0	2.70 0 0	1.73 0 0
Placer	Max 8 Hour (ppm)[1] Days > CAAQS (20 ppm) Days > NAAQS (35 ppm)	1.27 0 0	* * *	* * *
Nitrogen Dioxide - Annual				
Sacramento	Annual Average (ppm)	0.011	*	0.013
Placer	Annual Average (ppm)	0.013	0.013	0.012
Nitrogen Dioxide - 1 Hour				
Sacramento	Max 1 hour (ppm) Days > CAAQS (0.25 ppm)	0.060 0	0.097 0	0.127 0
Placer	Max 1 hour (ppm) Days > CAAQS (0.25 ppm)	0.079 0	0.063 0	0.058 0

County/Pollutant / Monitoring Station		2005	2006	2007
Sulfur Dioxide				
Sacramento	Max 24 hour (ppm) Days > CAAQS (0.04 ppm) Days > NAAQS (0.14 ppm)	0.002 0 0	0.003 0 0	0.004 0 0

Notes:
*There was insufficient (or no) data available to determine the value.
[1] Measurement statistic based on California approved sampling methods.
> = exceed; ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; max = maximum;
CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard.
Yolo = Woodland-Gibson Road air monitoring station.
Sacramento = North Highland-Blackfoot Way air monitoring station.
Placer = Roseville-North Sunrise Boulevard air monitoring station.
Source: CARB 2008.

Local Sources of Air Pollutants

Land use along the Project area is predominantly agriculture and rural residences. Agriculture operations contribute fugitive dust emissions from field activities and unpaved roads. Major roadways that intersect the Project alignment include Interstate (I) 5, I-505, State Route (SR) 113, and SR-99/70. The Sacramento Metropolitan Airport is located approximately 1.49 miles south of the Powerline Road Distribution Feeder Main (DFM).

Sensitive Receptors

Those who are sensitive to air pollution include children, the elderly, and persons with preexisting respiratory or cardiovascular illness. For purposes of CEQA, the CARB considers a sensitive receptor to be a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Examples of sensitive receptors include hospitals, residences, convalescent facilities, schools, and parks. No hospitals or convalescent facilities are located within 1 mile of the Project area.

Yolo County contains the largest section of the pipeline, which would pass within close proximity (0.5 mile) to multiple individual rural residences disbursed throughout the length of the Yolo County section. Of specific note are the clusters of approximately 10 rural residences in the Hungry Hollow area located on CR-17 between CR-87 and CR-88A; approximately 6 rural residences in the Dunnigan Hills area; and approximately 15 rural residences northeast of the unincorporated community of Yolo.

Within Sutter County, there are approximately 10 rural residences on Riego Road (along which the pipeline would travel) between the Sacramento River and Natomas Road. Further east on Riego Road, between Natomas Road and the Sutter/Placer county boundary, there is an area of multiple semi-rural residences.

Within Sacramento County, there are no sensitive receptors located within 0.5 mile of the Powerline Road DFM portion of the pipeline.

Within Placer County, there are approximately 24 residences along Baseline Road within 0.5 mile of the proposed pipeline route. The pipeline's eastern terminus is located adjacent to areas consisting of suburban residences within the City of Roseville limits. Additionally, Coyote Ridge Elementary School, located at 1751 Morningstar Drive in Roseville is located less than 0.5 mile from the pipeline's eastern end.

Greenhouse Gas Emissions and Climate Change

Greenhouse gases play a critical role in the earth's radiation budget by trapping infrared radiation emitted from the earth's surface, which would otherwise have escaped into space. Prominent GHGs contributing to this process include CO_2, CH_4, ozone, water vapor, N_2O, and chlorofluorocarbons (CFCs). This phenomenon, known as the "Greenhouse Effect," is responsible for maintaining a habitable climate. Anthropogenic emissions of these GHGs in excess of natural ambient concentrations are responsible for the enhancement of the Greenhouse Effect and have led to a trend of unnatural warming of the earth's natural climate, known as global warming or climate change. Emissions of these gases that induce global warming are attributable to human activities associated with industrial/ manufacturing, utilities, transportation, residential, and agricultural sectors (CEC 2006). Transportation is responsible for 41 percent of the state's GHG emissions, followed by electricity generation (CEC 2006). Emissions of CO_2 and NO_X are by-products of fossil fuel combustion. Methane, a potent GHG, results from off-gassing associated with agricultural practices and landfills. Sinks of CO_2 include uptake by vegetation and dissolution into the ocean.

Global warming is a global problem, and GHGs are global pollutants, unlike ozone, carbon dioxide, particulate matter, and TACs, which are pollutants of regional and local concern. Worldwide, California is the 12^{th} to 16^{th} largest emitter of CO_2 and is responsible for approximately 2 percent of the world's CO_2 emissions (CEC 2006).

In 2004, California produced 497 million gross metric tons of carbon dioxide-equivalent (CARB 2007b).

Potential Environmental Effects

Worldwide, average temperatures are likely to increase by 1.8 degrees Celsius (°C) to 4 °C, or approximately 3 °F to 7 °F by the end of the 21st Century (IPCC 2007). However, a global temperature increase does not translate to a uniform increase in temperature in all locations on the earth. Regional climate changes are dependant on multiple variables, such as topography. One region of the earth may experience increased temperature, increased incidents of drought and similar warming effects, whereas another region may experience a relative cooling. According to the Intergovernmental Panel on Climate Change's (IPCC) Working Group II Report (IPCC 2007b), climate change impacts to North America may include: diminishing snowpack; increasing evaporation; exacerbation of shoreline erosion; exacerbation of inundation from sea level rising; increased risk and frequency of wildfire; increased risk of insect outbreaks; increased experiences of heat waves; and rearrangement of ecosystems as species and ecosystems shift northward and to higher elevations.

For California, climate change has the potential to incur/exacerbate the following environmental impacts (CAT 2006):

<u>Air Pollution</u>

- Increased frequency, duration, and intensity of conditions conducive to air pollution formation (particularly ozone).

<u>Water Resources</u>

- Reduced precipitation;
- Changes to precipitation and runoff patterns;
- Reduced snowfall (precipitation occurring as rain instead of snow);
- Earlier snowmelt;
- Decreased snowpack;
- Increased agricultural demand for water; and

- Intrusion of seawater into coastal aquifers.

Agricultural Impacts

- Increased growing season; and
- Increased growth rates of weeds, insect pests, and pathogens.

Coastal Impacts

- Inundation by sea level rise.

Forests and Natural Landscapes Impacts;

- Increased incidents and severity of wildfire events; and
- Expansion of the range and increased frequency of pest outbreaks.

Although certain environmental effects are widely accepted to be a potential hazard to certain locations, such as rising sea level for low-laying coastal areas, it is currently infeasible to predict all environmental effects of climate change on any one location.

4.3.2 Regulatory Setting

Air pollutants are regulated at the Federal, State, and air basin level; each agency has a different degree of control. The EPA regulates at the national level. The CARB regulates at the State level. The YSAQMD, SMAQMD, PCAPCD, and FRAQMD regulate air quality in the four counties spanned by the Project.

Federal

The EPA handles global, international, national, and interstate air pollution issues and policies. The EPA provides research and guidance in air pollution programs, and sets NAAQS, also known as Federal standards. There are NAAQS for six common air pollutants, called criteria air pollutants, which were identified resulting from provisions of the Clean Air Act of 1970 (CAA). Criteria air pollutants include ozone, particulate matter (both PM_{10} and $PM_{2.5}$), NO, CO, lead and SO_2.

The NAAQS were set to protect public health, including that of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants.

The EPA also sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans (SIP). Under direction of the EPA, a State with Federal nonattainment areas is required to prepare and submit a SIP. The SIP integrates Federal, State, and local plan components and regulations to identify a combination of performance standards and market-based programs specific measures that will enable nonattainment areas to reduce pollution and attain Federal standards.

Table 4.3-3 shows both the California and Federal ambient air quality standards and presents the effects and sources of each pollutant.

State

The CARB has overall responsibility for statewide air quality maintenance and air pollution prevention. The SIP for the State of California is administered by the CARB. The SIP describes existing air quality conditions and measures that will be followed to attain and maintain the NAAQS. The SIP incorporates the individual plans for regional Air Districts that are Federal nonattainment areas. Regional air quality attainment plans prepared by individual regional Air Districts are sent to the CARB to be approved and incorporated into the California SIP. SIPs include the technical foundation for understanding the air quality (e.g. emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms. The CARB also administers CAAQS, or State standards, for the ten air pollutants designated in the California Clean Air Act (CCAA). The ten state air pollutants are the six national criteria pollutants plus visibility reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride.

The CARB is a part of the California Environmental Protection Agency. In addition to the development of California's SIP, the ARB is responsible for the coordination and administration of both Federal and State air pollution control programs in California. The CARB conducts research, sets the CAAQS, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. Emission standards for motor vehicles sold in California, other consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment are all monitored by the CARB. Fuel specifications intended to further reduce vehicular emissions are also set by the CARB.

Table 4.3-3: State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Air Pollutant	Averaging Time	California Standard	Federal Standard	Pollutant Health and Atmospheric Effects
Ozone (O_3)	1 Hour	0.09 ppm	—	(a) Decrease of pulmonary function and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; (f) Property damage.
	8 Hour	0.070 ppm	0.075 ppm	
Carbon Monoxide (CO)	1 Hour	20 ppm	35 ppm	(a) Aggravation of angina pectoris (chest pain or discomfort) and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses.
	8 Hour	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm	—	a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration.
	Annual Mean	0.030 ppm	0.053 ppm	

Air Pollutant	Averaging Time	California Standard	Federal Standard	Pollutant Health and Atmospheric Effects
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm	—	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
	24 Hour	0.04 ppm	0.14 ppm	
	Annual Mean	—	0.030 ppm	
Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	150 µg/m^3	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in the elderly.
	Annual Mean	20 µg/m^3	—	
Particulate Matter ($PM_{2.5}$)	24 Hour	—	35 µg/m^3 [2]	
	Annual Mean	12 µg/m^3	15.0 µg/m^3	
Lead[1]	30-day	1.5 µg/m^3	—	(a) Learning disabilities; (b) impairment of blood formation and nerve conduction.
	Quarter	—	1.5 µg/m^3	
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer; visibility of ten miles or more (0.07 to 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent.	—	(a) Visibility impairment

Air Pollutant	Averaging Time	California Standard	Federal Standard	Pollutant Health and Atmospheric Effects
Sulfates	24 Hour	25 μg/m^3	—	(a) Decreased ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Increased risk of cardio-pulmonary disease; (d) Damage to materials, property, and ecosystems
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	—	(a) Exposure to a very disagreeable odor.
Vinyl Chloride[1]	24 Hour	0.01 ppm	—	(a) Central nervous system effects, such as dizziness, drowsiness and headaches; (b) Liver damage; (c) Increased risk of angiosarcoma, a form of liver cancer.

Notes:
1. The CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Abbreviations:
ppm = parts per million (concentration)
μg/m^3 = micrograms per cubic meter
Annual Mean = Annual Arithmetic Mean
30-day = 30-day average
Quarter = Calendar quarter
Source: CARB 2007a. EPA 2008.

Recent Air Quality Standards

In 2006, EPA tightened the 24-hour $PM_{2.5}$ standard from 65 micrograms per cubic meter (μg/m^3) to 35 μg/m^3 and retained the existing annual standard of 15.0 μg/m^3. The EPA promulgated a new 8-hour standard for ozone on March 12, 2008, effective March 27, 2008. In addition, the EPA is proposing to revise the lead standard to within the range of 0.10 μg/m^3 to 0.30 μg/m^3, and it is currently holding public hearings and accepting comments.

The State nitrogen dioxide standard was amended on February 22, 2007. These changes became effective March 20, 2008.

Toxic Air Contaminant Regulation

Regulation of TACs is achieved through Federal and State controls on individual sources. The Federal CAA Amendments offer a comprehensive plan for achieving significant reduction in both mobile- and stationary-source emissions of certain designated Hazardous Air Pollutants (HAP). All major stationary sources of designated HAPs are required to obtain and pay the required fees for an operating permit under Title V of the Federal CAA Amendments.

The California legislature enacted the Toxic Air Contaminant Identification and Control Act (AB 1807, Tanner 1983) governing the release of TACs into the air. This law charges the CARB with the responsibility for identifying substances as TACs, setting priorities for control, adopting control strategies, and promoting alternative processes. The CARB has designated almost 200 compounds as TACs. In addition, the CARB compiles a statewide TACs inventory, oversees exposure notifications, and requires facility plans under the Air Toxics “Hot Spots” Information and Assessment Act (AB 2588, Connelly 1987), which supplements AB 1807. The Hot Spots Act was amended in 1992, and now requires facilities that pose a significant health risk to nearby communities to reduce their risk through a risk management plan.

As stated in the pollutant descriptions above, the CARB has identified the ten TACs that pose the greatest known health risk in California as: acetaldehyde, benzene, 1,3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and DPM.

In July 2001, the ARB approved an Air Toxic Control Measure (ATCM) for construction, grading, quarrying, and surface mining operations to minimize naturally occurring asbestos emissions. The regulation requires application of Best Management Practices (BMPs) to control fugitive dust in areas known to have naturally occurring asbestos, as well as requires notification to the local air district prior to commencement of ground-disturbing activities.

Air Quality and Land Use Handbooks

The ARB adopted the Air Quality and Land Use Handbook: A Community Health Perspective (Land Use Handbook). The Land Use Handbook provides information and guidance on siting sensitive receptors in relation to sources of TACs. The sources of TACs identified in the Land Use Handbook are high traffic freeways and roads, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and large gas dispensing facilities. If the Project involves siting a sensitive receptor or source of TAC discussed in the Land Use Handbook, siting mitigation may be added to avoid potential land use conflicts, thereby reducing the potential for health impacts to the sensitive receptors.

Local

Air Districts

Local air quality and air pollution management districts are responsible for developing rules that regulate stationary sources, area sources, and certain mobile sources. In addition, they establish permitting requirements for stationary sources, enforce air quality rules, and maintain air quality monitoring stations in their respective jurisdictions. The air districts are responsible for developing and updating the State attainment plans and triennial assessments. In addition, the FRAQMD, SCAQMD, YSAQMD, and PCAPCD work in conjunction with each other and the Sacramento Area Council of Governments (SACOG), in developing, updating, and implementing the Federal SIP for the Sacramento Metropolitan Area. The SACOG is an association of local governments in the six-county Sacramento Region, including agencies from or located in El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba counties.

The SMAQMD, the FRAQMD and the YSAQMD have adopted CEQA guidance documents for their respective jurisdictions. The CEQA guidance documents provide recommended methodologies and thresholds to help assess a project's potential for significant air quality impacts in the framework of CEQA. These guidance documents also provide screening criteria, and recommended measures to reduce significant impacts. The applicable air district CEQA guides for the Project area are:

- SMAQMD - Guide to Air Quality Assessment in Sacramento County. July 2004;
- FRAQMD - Indirect Source Review Guidelines. 1998; and
- YSAQMD - Handbook for Assessing and Mitigating Air Quality Impacts. July 2007.

Federal Air Quality Attainment Plans

The Federal nonattainment plan for the Sacramento Federal Nonattainment Area is the 1994 Sacramento Area Regional Ozone Attainment Plan. The five air districts that comprise the Sacramento Federal Nonattainment area are the SMAQMD, FRAQMD, PCAPCD, YSAQMD, and the El Dorado County AQMD. The air districts of the Sacramento region adopted a Rate of Progress (ROP) Plan for the Federal 8-hour ozone standard in 2006.

In addition, the districts adopted the 2011 Reasonable Further Progress Plan (RFP) for the 8-hour Federal ozone standard in April 2008. The RFP shows that the Sacramento region cannot meet the 2013 attainment deadline, and is the basis for the voluntary Federal reclassification request, discussed further below.

Public workshops for the draft 8-hour Attainment Demonstration Plan were held in September 2008 and it is expected that the draft plan will go to the air districts' respective Board of Directors for adoption in early 2009.

Concerning the Federal PM standards, the SMAQMD published a staff report November 2007, entitled the 2006 PM2.5 Standard: Evaluating the Nine Factors in Setting Nonattainment Area Boundaries for the Sacramento Region. The staff report evaluated ambient air quality monitoring results, population growth, traffic and commuting, and other metrics for the Sacramento Region. The EPA is expected to issue a final decision for Federal $PM_{2.5}$ nonattainment boundaries by December 2008. If an area is designated nonattainment, an attainment plan must be submitted not later than 3 years after the effective date of the designation.

State Air Quality Attainment Plans

The CCAA does not contain planning requirements for areas in nonattainment of the State PM_{10} standards, but air districts must demonstrate to the CARB that all feasible measures for their district have been adopted.

However, State ozone standards do have planning requirements. The CCAA requires air districts that are nonattainment of the State ozone standards to adopt air quality attainment plans and to review and revise their plans to address deficiencies in interim measures of progress once every three years. Each air district's State plans are discussed in the district-specific sections below.

Voluntary Federal Reclassification Request

The five air districts that comprise the Sacramento Federal Nonattainment Area requested the CARB to submit a formal request to the EPA to reclassify the area from "serious" to "severe" nonattainment for the Federal 8-hour ozone standard. The request is based on an evaluation of the emission reductions necessary to attain the Federal standard, and the emission reductions associated with feasible rules. It was determined that the Sacramento Federal Nonattainment Area would not be able to achieve the necessary emission reduction in the attainment timeframe through the existing suite of feasible rules. The CARB submitted the request on February 14, 2008.

Air District Regulations

Air districts develop rules to control the emissions of air pollutants from various sources within their boundaries. Compliance with applicable air district rules is a requirement. Some rules affect the Project indirectly, such as rules that regulate the products that may be used during construction. Other rules affect the Project directly, primarily through requiring emission rate limits and visibility limits on particulate matter emissions during construction and other earth-disturbing activities. The air districts have promulgated a series of rules that, if not identical in language, are similar in purpose and requirements. These similar rules are listed in this Section. Additional air district rules are listed below in the air district-specific sections.

Darkness/Opacity Based Rules. These rules place limits on visible emissions of any air contaminant based on the Ringelmann Chart. All four districts place the limit at a shade as dark or darker than a Ringelmann Chart Number (described for each district below), as published by the United States Bureau of Mines, or of such opacity to obscure an observer's view to a degree equal to or greater than does smoke that is at or darker than Ringelmann Chart No. 2.

- **YSAQMD - Rule 2.3** (Ringelmann Chart), Ringelmann Chart No. 2;
- **SMAQMD - Rule 401** (Ringelmann Chart), Ringelmann Chart No. 1;
- **FRAQMD - Rule 3.0** (Visible Emissions), Ringelmann Chart No. 2; and
- **PCAPCD - Rule 202** (Visible Emissions), Ringelmann Chart No. 1.

Emissions Rate Based Rules. These rules limit the quantity of PM in the atmosphere through establishment of an emission concentration limit. The emission rates in each district's respective rules are listed below.

- **YSAQMD - Rule 2.11** (Particulate Matter), 0.3 grains per cubic foot;
- **SMAQMD - Rule 404** (Particulate Matter), 0.1 grains per cubic foot;
- **FRAQMD - Rule 3.2** (Particulate Matter Concentration), 0.3 grains per cubic foot; and

- **PCAPCD - Rule 207** (Particulate Matter), 0.1 grains per cubic foot.

Nuisance Rules. The YSAQMD, SMAQMD, and PCAPCD adopted rules that incorporate the nuisance language of the California Health and Safety Code section 41700, which states:

> A person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause or have natural tendency to cause injury or damage to business or property.

- **YSAQMD - Rule 2.5** (Nuisance);
- **SMAQMD - Rule 402** (Nuisance); and
- **PCAPCD - Rule 205** (Nuisance).

Reasonable Precaution Rules. Both the SMAQMD and the FRAQMD have dust control rules that require persons to take “every reasonable precaution” to prevent fugitive dust from being airborne beyond the property line from which the dust originated.

- **SMAQMD - Rule 403** (Fugitive Dust); and
- **FRAQMD - Rule 3.16** (Fugitive Dust Emissions).

Yolo-Solano Air Quality Management District

The YSAQMD’s plan for attaining the State ozone standard is the 1992 Air Quality Attainment Plan (AQAP), which was updated most recently in 2003. The following YSAQMD rules are applicable to the Project directly, and compliance is required:

- **Rule 2.12 Specific Contaminants.** A person shall not discharge into the atmosphere from any single source of emission whatsoever, any one or more of the following contaminants, in any State or combination thereof, in excess of the following concentrations at the point of discharge: (a) Sulfur compounds calculated as sulfur dioxide (SO2) O.2 percent, by volume at standard conditions, (b) Particulate Matter Combustion Contaminants: 0.3 grains per cubic foot of gas calculated to 12 percent of carbon dioxide (CO_2) at standard conditions, except during the start of an operation or change in energy source, during the time necessary to bring the combustion process up to operating level. In measuring the combustion contaminants from incinerators used to dispose of combustible refuse by burning, the carbon dioxide (CO_2) produced by combustion of any liquid or gaseous fuels shall be excluded from the calculation to 12 percent of carbon dioxide (CO_2); and

- **Rule 2.23 - Fugitive Hydrocarbon Emissions.** The purpose of this rule is to control fugitive emissions of hydrocarbons from oil and gas production and processing facilities, refineries, chemical plants, gasoline terminals, and pipeline transfer stations in conformance with RACT determinations approved by the CARB to meet the requirements of the CCAA. The rule contains inspection requirements, time frames for repair of leaks based on leak volume, monitoring and recordkeeping requirements.

Sacramento Metropolitan Air Quality Management District

The SMAQMD is currently under the 1991 AQAP which was developed to address Sacramento County's nonattainment status for State ozone and CO standards, and, although not required, PM_{10} standards. The SMAQMD's 2003 Triennial Report was adopted on April 28, 2005 and the 2006 Annual Progress Report was adopted on October 25, 2007.

In addition, if a construction project is within an area containing NOA, the project must submit a Dust Mitigation Plan or Geologic Evaluation to the SMAQMD prior to receiving a grading permit.

Feather River Air Quality Management District

The southern portion of Sutter County is in the Sacramento Federal Nonattainment Area, as discussed above, and abides by the 1994 Sacramento Area Regional Ozone Attainment Plan. The FRAQMD is also part of the Northern Sacramento Valley Planning Area. The Northern Sacramento Valley Air Basin California 2006 Air Quality Attainment Plan was prepared to comply with the CCAA planning requirements. However, Federal and State plans adopted for the Northern Sacramento Valley Air Basin do not apply to the Project, as the Project is not in the Northern Sacramento Valley Air Basin.

Placer County Air Pollution Control District

There are no additional plans or rules specific to the PCAPCD beyond those discussed above.

Counties

Yolo County

The Yolo County General Plan includes goals and policies that improve air quality, primarily through transportation, transit, and bicycle infrastructure. The Conservation Element contains an air-specific policy, CON 15, which includes interagency coordination, transportation and land use language, and measures to improve waste collection and disposal, among other measures. However, there are no policies directly applicable to the Project.

Yolo County committed to participating in the Cool Counties Climate Stabilization Declaration in September 2007, with a goal of reducing GHG emissions by 80 percent by the year 2050. Yolo County is also a member of the California Climate Action Registry (CCAR). Under the CCAR, Yolo County is required to establish baseline energy usage, and annual reporting to document reduction in usage. The County has a series of example actions and programs on the County's website that illustrate how Yolo County organizations are increasing energy efficiency. More can be found at www.yolocounty.org. The following Yolo County measure is currently under development and would be applicable to the Project:

- A Construction and Demolition (C&D) recycling ordinance to require 50 percent of construction and demolition debris be recycled and diverted from land filling.

Sutter County

Within the Sutter County General Plan, goals and policies are identified to improve the air quality in Sutter County. Similar to the Yolo County General Plan discussed above, there are measures that improve air quality through transportation, transit, and bicycle infrastructure. The Conservation/Open Space - Natural Resources Element contains two goals specific to air quality—Goal 4.I and Goal 4.J. The two policies provided for Goal 4.I relate to coordination with the FRAQMD, whereas Goal 4.J and its related policy pertain to the land use and transportation planning process.

Sacramento County

The Sacramento County General Plan contains an Air Quality Element, with the following applicable policies:

- **AQ-5:** Require the use of Best Available Control Technology (BACT) to reduce air pollution emissions.

In addition, Sacramento County is a member of the CCAR and the International Council for Local Environmental Initiatives (ICLEI), and is currently preparing a climate action plan. The administrative draft of the Greenhouse Gas Emission Inventory for Sacramento County - Unincorporated Areas, published January 2008, used ICLEI's Clean Air and Climate Protection software to estimate the GHG emissions.

Placer County

The Placer County General Plan also contains air-specific goals designed to improve air quality. Goal 6.F is to protect and improve air quality in Placer County. The policies listed under Goal 6.F include measures for interagency coordination, and review and modification of projects to reduce air quality impacts.

- **Goal 6.F.6:** The County shall require project-level environmental review to include identification of potential air quality impacts and designation of design and other appropriate mitigation measures or offset fees to reduce impacts. The County shall dedicate staff to work with project proponents and other agencies in identifying, ensuring the implementation of, and monitoring the success of mitigation measures;

- **Goal 6.F.8:** The County shall submit development proposals to the PCAPCD for review and comment in compliance with CEQA prior to consideration by the appropriate decision-making body; and

- **Goal 6.F.10:** The County may require new development projects to submit an air quality analysis for review and approval. Based on this analysis, the County shall require appropriate mitigation measures consistent with the PCAPCD's 1991 Air Quality Attainment Plan (or updated edition).

City of Roseville

- Project construction would take place within the City of Roseville's sphere of influence but outside of the City limits. Roseville does not have jurisdiction over areas within its sphere of influence. However, Roseville and Placer County maintain a City/County Memorandum of Understanding that ensures development proposed within the City's sphere of influence is planned for cooperatively, through input from both agencies (City of Roseville 2004). The City/County Memorandum of Understanding identifies that any environmental impacts must be mitigated to a level of less than significant unless both Placer County and Roseville agree that specific overriding considerations render such mitigation measures infeasible.

Climate Change

Federal

After a thorough scientific review ordered in 2007 by the U.S. Supreme Court, the U.S. Environmental Protection Agency (EPA) issued a proposed finding on April 17, 2009, that greenhouse gases contribute to air pollution that may endanger public health or welfare. The EPA announced that it may regulate carbon dioxide and other greenhouse gases under the Clean Air Act. The proposed endangerment finding now enters the public comment period, which is the next step in the deliberative process EPA must undertake before issuing final findings. Before taking any steps to reduce greenhouse gases under the Clean Air Act, EPA would conduct an appropriate process and consider stakeholder input.

State

There has been significant legislative activity regarding global climate change and GHGs in California. Although it was not originally intended to reduce GHGs, California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The latest amendments were made in October 2005 and currently require new homes to use half the energy they used only a decade ago. Energy efficient buildings require less electricity, and electricity production by fossil fuels results in GHG emissions. Therefore, increased energy efficiency results in decreased GHG emissions.

California Assembly Bill 1493 (Pavley), enacted on July 22, 2002, required the CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Regulations adopted by the CARB would apply to 2009 and later model year vehicles. The CARB estimates that the regulation would reduce climate change emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030.

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S 3-05, the following GHG emission reduction targets:

1. By 2010, reduce GHG emissions to 2000 levels;
2. By 2020, reduce GHG emissions to 1990 levels; and
3. By 2050, reduce GHG emissions to 80 percent below 1990 levels.

Climate Action Team

To meet these targets, the Governor directed the Secretary of the Cal EPA to lead a Climate Action Team (CAT) made up of representatives from the Business, Transportation and Housing Agency; the Department of Food and Agriculture; the Resources Agency; the Air Resources Board; the Energy Commission; and the Public Utilities Commission. The CAT's Report to the Governor in 2006 contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met.

The 2006 CAT Report contains baseline emissions as estimated by the CARB and the California Energy Commission. The emission reduction strategies reduce GHG emissions to the targets contained in AB 32; the 2006 CAT Report is consistent with AB 32.

AB 32

Also in 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006, which charged the CARB to develop regulations on how the state would address global climate change. AB 32 focuses on reducing GHG emissions in California. Greenhouse gases, as defined under AB 32, include carbon dioxide, methane, nitrous oxide, HFCs, PFCs, and sulfur hexafluoride (SF_6). AB 32 requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. The CARB is the state agency charged with monitoring and regulating sources of emissions of GHGs that cause global warming in order to reduce emissions of GHGs, and AB 32 contains several specific requirements for the CARB. Among other measures, AB 32 requires that:

- The CARB determine what the statewide GHG emissions level was in 1990, and it must approve a statewide GHG emissions limit so it may be applied to the 2020 benchmark. The CARB adopted the 1990 GHG emission inventory/2020 emissions limit of 427 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) on December 6, 2007; and
- The CARB must ensure that early voluntary reductions receive appropriate credit in the implementation of AB 32. In February 2008, the CARB approved a policy statement that established a procedure for project proponents to submit voluntary reduction assessment methods to the CARB for evaluation.

The CARB approved the Climate Change Proposed Scoping Plan (Proposed Scoping Plan) on December 11, 2008. The Scoping Plan describes the recommended State actions and strategies needed to achieve the 2020 GHG emissions limit. The CARB plans to develop strategies to implement all of the recommended measures that must be in place by 2012.

<u>SB 97</u>

SB 97 was passed in August 2007. SB 97 indicates that section 21083.05 will be added to the Public Resources Code, "(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a)" (SB 97). Section 21097 is also added to the Public Resources Code and indicates that the failure to analyze adequately the effects of GHGs in a document related to the environmental review of a transportation project funded under the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 does not create a cause of action for a violation. However, SB 97 does not safeguard non-transportation funded projects from being challenged in court for omitting a global climate change analysis.

OPR

The Governor's Office of Planning and Research (OPR) submitted proposed amendments to the CEQA Guidelines to the Secretary for Natural Resources on April 13, 2009. The proposed amendments contain recommendations for addressing greenhouse gas emissions, as required by SB 97. The rulemaking process for the completion and adoption of the Amendments is to be completed by January 1, 2010. The OPR has also published a technical advisory on CEQA and Climate Change, as required under SB 97, on June 19, 2008. The guidance did not include a suggested threshold, but stated that the OPR has asked CARB to, "recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state." The OPR does recommend that CEQA analyses include the following components:

- Identify GHG emissions;
- Determine significance; and
- Mitigate impacts.

CARB

Under AB 32, the CARB published its Final Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California. Discrete early action measures are currently underway or are enforceable by January 1, 2010. Early action measures are regulatory or non-regulatory and are currently underway or to be initiated by the CARB in the 2007 to 2012 timeframe. The CARB has 44 early action measures that apply to the transportation, commercial, forestry, agriculture, cement, oil and gas, fire suppression, fuels, education, energy efficiency, electricity, and waste sectors. Of those early action measures, nine are considered discrete early action measures, as they are regulatory and enforceable by January 1, 2010. The CARB estimates that the 44 recommendations are expected to result in reductions of at least 42 million metric tons of CO_2 equivalent ($MMTCO_2e$) by 2020, representing approximately 25 percent of the 2020 target.

Under AB 32, the CARB has the primary responsibility for reducing GHG emissions. However, the CAT Report also contains strategies that many other California agencies such as the CSLC can take in carrying out their authority. The CAT published a public review draft of Proposed Early Actions to Mitigate Climate

Change in California. Most of the strategies were in the 2006 CAT Report or are similar to the 2006 CAT strategies.

California is also exploring the possibility of cap and trade systems for GHGs. The Market Advisory Committee to the CARB published draft recommendations for designing a GHG cap and trade system for California.

<u>Executive Order S-01-07</u>

Executive Order S-01-07 was enacted by California's Governor on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. It also requires that a Low Carbon Fuel Standard for transportation fuels be established for California.

<u>Local Air District Guidance</u>

The SMAQMD released guidance on addressing climate change in CEQA documents on September 6, 2007. The guidance discusses how local agencies adopt significance thresholds, and recommends that CEQA documents include a discussion of the project's GHG emissions from construction and operation. The guidance letter also contains GHG impact mitigation measures available.

4.3.3 Significance Criteria

For the purposes of this EIR, to determine whether impacts to air quality are significant environmental effects, the following questions are analyzed and evaluated. Appendix G of the CEQA Guidelines presents recommended impact questions to assist lead agencies in evaluating environmental impacts. In addition, the local air districts have recommended air pollution thresholds to be used by the lead agencies in determining whether the proposed Project could result in a significant impact. An adverse impact on air quality is considered significant and would require mitigation as specified below.

1. Result in construction or operational emissions that exceed quantitative significance thresholds (including quantitative thresholds for ozone precursors) established by air pollution control districts in which the Project would be constructed (Table 4.3-4);

2. Result in emissions that substantially contribute to an exceedance of a State or Federal ambient air quality standard;

3. Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable Federal or State ambient air quality standard. Project emissions would be considered "cumulatively considerable" if the Project would:

   - Require a change in the existing land use designation (i.e., general plan amendment, rezone), and projected emissions of the Project are greater than the emissions anticipated for the site if developed under the existing land use designation; or

   - Projected emissions, or emission concentrations, of the Project are greater than the emissions anticipated for the site if developed under the existing land use designation.

4. Expose sensitive receptors (including residential areas) or the general public to substantial levels of toxic air contaminants; or

5. Create objectionable odors of such frequency, intensity, or duration that would affect a substantial number of people or be otherwise considered a nuisance.

The CSLC does not currently have a defined threshold of significance for climate change or GHG emission impacts. GHG emissions thresholds to be used during CEQA evaluations have not been established at this time by the CARB, OPR, Executive Order, or any of the four counties in which this project is located, nor by legislation.

Table 4.3-4: Daily Thresholds of Significance (pounds per day)

Air District	Construction	Operation
YSAQMD		
NO_X	82	82
ROG	82	82
PM_{10}	150	150
SMAQMD		
NO_X	85	65
ROG	*None*	65

Air District	Construction	Operation
PM_{10}	5 percent of CAAQS/NAAQS[1]	CAAQS/NAAQS[1]
FRAQMD		
NO_X	25	25
ROG	25	25
PM_{10}	80	80
PCAPCD		
NO_X	82	10
ROG	82	10
PM_{10}	82	82
CO	550	550

Notes
[1] SMAQMD does not have a daily emission threshold for PM10; however, the criteria of significance are based on the NAAQS and CAAQS.

Methodology

1. For the construction analysis, the 'worst-case' construction day was determined for Line 406, 407E, 407W, and the DFM, and the air emissions were modeled for that worst-case scenario, for the years of construction estimated for the respective portion of the pipeline. The construction analysis differentiates between the activities in each air district in that only activities that would occur within each air district were compared to that district's thresholds. The analysis was prepared using information provided by PG&E. Data included the anticipated construction equipment per phase of trenching, HDD and jack and bore installation. This information was used to determine the off-road construction emissions for the Project. The EMFAC2007 emission factors were utilized to estimate emissions from the anticipated construction equipment.

2. Data provided also included the average trip length and trips per day for pipe and soils hauling. The hauling, fugitive dust, paving and construction employee trips estimates used the CARB-approved URBEMIS2007 v9.2.4 (URBEMIS) computer program.

3. Daily increases in vehicular emissions associated operation of the Project were generated using URBEMIS. The operational analysis estimated emissions resulting from all maintenance and inspection activities and compared the total projected operational emissions to each air district's thresholds.

4. A detailed description of the methodology, inputs and outputs of the emissions analysis are available in Appendix D.

4.3.4 Applicant Proposed Measures

Applicant Proposed Measures (APMs) have been identified by PG&E in its Preliminary Environmental Analysis prepared for the CSLC. APMs that are relevant to this Section are presented below. This impact analysis assumes that all APMs would be implemented as defined below. Additional mitigation measures are recommended in this Section if it is determined that APMs do not fully mitigate the impacts for which they are presented.

APM AQ-1. PG&E will compile a comprehensive inventory list (i.e., make, model, engine year, horsepower, emission rates) of all heavy-duty off-road (portable and mobile) equipment having 50 horsepower or greater that will be used an aggregate of 40 or more hours for construction and apply the following mitigation measure: The contractor shall provide a plan demonstrating that the heavy-duty (equal to or greater than 50 horsepower) off-road equipment to be used in the construction project will achieve a project-wide fleet-average 20 percent NO_X reduction and 45 percent particulate reduction compared to the most recent CARB fleet average at time of construction.

APM AQ-2. PG&E will ensure that construction equipment exhaust emissions will not exceed Visible Emission limitations (40 percent opacity or Ringelmann 2.0). Operators of vehicles and equipment found to exceed opacity limits will take action to repair the equipment within 72 hours or remove the equipment from service. Failure to comply may result in a Notice of Violation.

APM AQ-3. PG&E will prepare and implement a fugitive dust mitigation plan.

APM AQ-4. The primary contractor will be responsible to ensure that all construction equipment is properly tuned and maintained.

APM AQ-5. PG&E will minimize equipment and vehicle idling time to five minutes.

APM AQ-6. PG&E will ensure that an operational water truck will be on-site at all times, and will apply water to control dust three times daily, or as needed, to prevent dust impacts off-site.

APM AQ-7. PG&E will utilize existing power sources (e.g., available electric power) or clean fuel generators, rather than temporary power generators.

APM AQ-8. PG&E will develop a traffic plan to minimize traffic flow interference from construction activities, as appropriate.

APM AQ-9. PG&E will not allow open burning of removed vegetation.

APM AQ-10. PG&E will ensure that all portable engines and portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor vehicles, comply with CARB Portable Equipment Registration with the State or a local district permit.

APM AQ-11. Contractors will limit operation on “spare the air” days within each County.

4.3.5 Impact Analysis and Mitigation

Impact Discussion

Cumulatively Considerable Net Increase of Criteria Pollutants

The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable Federal or State ambient air quality standard. Project emissions would be considered “cumulatively considerable” if the Project would:

1. Require a change in the existing land use designation (i.e., general plan amendment, rezone), and projected emissions of the Project are greater than

the emissions anticipated for the site if developed under the existing land use designation; or

2. Projected emissions, or emission concentrations, of the Project are greater than the emissions anticipated for the site if developed under the existing land use designation.

3. The Project would not require a change in land use designation, and the projected emissions would not be greater than the emissions anticipated for the Project alignment if developed under the existing land use designations. The long-term operational emissions associated with the Project would not constitute a significant increase in operational emissions for the Project area and impacts would be less than significant (Class III).

Sensitive Receptors

Toxic Air Contaminants impacts are assessed using a standard Maximally Exposed Individual health risk of 10 in 1 million. The CARB and the local air districts have categorized any source that poses an increased risk to the general population that is equal to or greater than 10 people out of 1 million contracting cancer as excessive. When estimating this risk, it is assumed that an individual is exposed to the maximum concentration of any given TAC continuously for 70 years. If the risk of such exposure levels meets or exceeds the threshold of 10 excess cancer cases per 1 million people, then the CARB and local air district require the installation of BACT for toxics or maximum available control technology to reduce the risk threshold.

Construction activities would involve the use of diesel-powered construction equipment, which emit DPM. As stated above, risk assessments for residential areas exposed to TACs are generally based on a 70-year period of exposure. Since the use of construction equipment would be temporary and would not be close to the 70-year timeframe, exposure of sensitive receptors to TACs would not be substantial. Emissions of DPM would not be substantial enough to be considered a significant health risk. Therefore, health risks from construction-related DPM would be less than significant.

A review of a map (DMG 2000) containing areas more likely to have rock formations containing naturally occurring asbestos in California indicates that the Project site is not in an area that is likely to contain naturally occurring asbestos. As noted in the Department of Conservation, Division of Mines and Geology’s report (DMG 2000), the map only shows the general location of naturally occurring asbestos-containing formations and may not show all potential occurrences. The nearest locations of documented NOA are shown approximately 13 miles west of Line 406 and 13 miles east of Line 407 East. Since the nearest locations are sufficiently far from the Project location, it is reasonable to assume that there is the little potential for NOA to be present at the Project site. Therefore, the Project construction does not have the potential to disturb NOA.

The Project would not expose sensitive receptors (including residential areas) or the public to substantial levels of toxic air contaminants and impacts would be less than significant (Class III).

Objectionable Odors

The proposed Project does not contain land uses typically associated with emitting objectionable odors. Diesel exhaust and ROGs would be emitted during construction of the Project, which are objectionable to some; however, emissions would disperse rapidly from the Project site and therefore should not be at a level to induce a negative response. Therefore, the construction and operation of the Project is not anticipated to result in significant objectionable odors.

The Project would not create objectionable odors of such frequency, intensity, or duration that would affect a substantial number of people or be otherwise considered a nuisance and impacts would be less than significant (Class III).

Impact AQ-1: Construction or Operation Emissions Exceeding Regional Thresholds

The Project would result in construction or operational emissions that exceed quantitative significance thresholds (including quantitative thresholds for ozone precursors) established by air pollution control districts in which the Project would be constructed (Significant, Class I).

The construction emissions associated with the Project are shown in Table 4.3-5, Table 4.3-6, Table 4.3-7, and Table 4.3-8.

All four major segments of the proposed Project would exceed the local air districts' significance thresholds for NO_X. In addition, Line 407 East, the DFM, and Line 407 West would exceed the FRAQMD's threshold for ROG. The estimated construction schedule for the Project is as follows:

- Line 406: September/October 2009 to February 2010;

- Line 407 West: May 2012 to September 2012;
- Line 407 East: May 2010 to September 2010; and
- DFM: May 2010 to September 2010.

The construction of Line 407 East and the DFM are expected to overlap temporarily. Line 407 East construction would occur in Sutter County and Placer County under the jurisdiction of the FRAQMD and the PCAPCD, respectively. The DFM construction would occur in Sutter County and Sacramento County, under the jurisdiction of the FRAQMD and the SMAQMD, respectively. Therefore, only Sutter County is expected to be impacted by the concurrent construction of Line 407 East and the DFM. The combined impact of Line 407 East and the DFM would exceed the FRAQMD's thresholds of significance for NO_X, ROG, and PM_{10} as shown in Table 4.3-9.

The construction scenario utilized the peak construction activity to estimate the maximum daily air pollutant emissions of concern. The maximum daily emissions for Line 406, 407E, 407W, and the DFM were calculated using the peak trenching activity, construction employee trips, water truck emissions, fugitive dust emissions, soil hauling and pipe hauling.

Construction of Line 406 is expected to begin in 2009 and end in early 2010. The worst-day scenario is applicable to activities occurring in 2009 and 2010. However, because emission factors for on-road and off-road equipment are higher in 2009 than 2010, emissions for construction of Line 406 were only estimated for the 2009 model year. Air pollutant emissions resulting from Line 406 construction activities in 2010 would not be greater than the 2009 modeling estimates.

Table 4.3-5: Line 406 Construction Emissions (2009)

	Pollutant Emissions (lbs/day)				
	NO_X	**ROG**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Maximum Daily Emissions	373.31	36.48	107.07	80.38	14.44
YSAQMD Threshold	82	82	NA	150	NA
Exceed Significance Threshold?	Yes	No	No	No	No
Source: Michael Brandman Associates 2009.					

Table 4.3-6: Line 407E Construction Emissions (2010)

	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	359.86	35.00	102.86	79.78	14.62
FRAQMD Threshold	25.00	25.00	NA	80.00	NA
PCAPCD Threshold	82.00	82.00	550.00	82.00	NA
Exceed Significance Threshold?	Yes	Yes	No	No	No

Notes:
NA = Not Applicable
Source: Michael Brandman Associates 2009.

Table 4.3-7: DFM Construction Emissions (2010)

	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	348.10	34.23	98.90	79.28	14.19
FRAQMD Threshold	25.00	25.00	NA	80.00	NA
SMAQMD Threshold	85.00	NA	NA	NA*	NA
Exceed Significance Threshold?	Yes	Yes	No	No	No

Notes:
* Concentration based threshold.
NA = Not Applicable
Source: Michael Brandman Associates 2009.

Table 4.3-8: Line 407W Construction Emissions (2012)

	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	300.69	30.58	89.58	77.10	14.19
YSAQMD Threshold	82	82	NA	150	NA
FRAQMD Threshold	25.00	25.00	NA	80.00	NA
Exceed Significance Threshold?	Yes	Yes	No	No	No

Notes:
NA = Not Applicable
Source: Michael Brandman Associates 2009.

Table 4.3-9: Maximum Daily Construction Emissions in Sutter County (2010)

	Pollutant Emissions (lbs/day)				
	NO_X	**ROG**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Line 407 East	359.86	35.00	102.86	79.78	14.62
DFM	348.10	34.23	98.90	79.28	14.19
Maximum Daily Emissions	707.96	69.23	201.76	159.06	28.81
FRAQMD Threshold	25.00	25.00	NA	80.00	NA
Exceed Significance Threshold?	Yes	Yes	No	Yes	No

Notes
NA = Not Applicable
Source: Michael Brandman Associates 2009.

Although not required by the individual local air districts or thresholds of significance, the total construction emissions were also calculated for the construction of the Project and are presented for illustrative purposes in Table 4.3-10.

Table 4.3-10: Total Emissions From Project Construction (All Years)

Year of Construction (Line)	Pollutant Emissions (Total Tons)				
	NO_X	**ROG**	**CO**	**PM_{10}**	**$PM_{2.5}$**
2009 (Line 406)	8.65	0.81	2.53	5.97	1.21
2010 (Line 407 East)	8.73	0.84	2.61	8.02	1.68
2010 (DFM)	1.77	0.17	0.55	5.71	1.20
2012 (Line 407 West)	7.85	0.80	2.50	7.59	1.55
Total	27.00	2.62	8.20	27.29	5.64

Source: Michael Brandman Associates 2009.

The operational emissions associated with the Project are shown in Table 4.3-11. Based on the table, none of the operational thresholds are anticipated to be exceeded. This is a less than significant impact.

Table 4.3-11: Operational Emissions (2010)

	Pollutant Emissions (lbs/day)				
	NO_X	**ROG**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Maximum Daily Emissions	0.38	0.08	0.69	0.26	0.05
YSAQMD Threshold	82	82	NA	150	NA
FRAQMD Threshold	25	25	NA	80	NA
SMAQMD Threshold	65	65	NA	NA*	NA
PCAPCD Threshold	10	10	550	82	NA
Exceed Significance Threshold?	No	No	No	No	No

Notes:
* Concentration based threshold.
NA = Not Applicable
Source: Michael Brandman Associates 2009.

APMs AQ-1 through AQ-11 reduce potential emissions from project construction. However, implementation of these APMs would not reduce construction impacts to less than significant. Implementation of APM AQ-1 will reduce expected NOx emissions by 20 percent, but due to the magnitude of NOx emissions, a 20 percent reduction would not reduce the impact to less than significant. Insufficient details and/or lack of a methodology prevent the quantification of reductions under APM AQ-2, APM AQ-3, APM AQ-4, APM AQ-5, APM AQ-7, APM AQ-8, and APM AQ-11. APM AQ-10 is an enhanced compliance measure for an existing registration requirement. As a result, MMs AQ-1a and AQ-1b are required to be implemented.

Mitigation Measures for Impact AQ-1: Construction or Operation Emissions Exceeding Regional Thresholds

MM AQ-1a. **Fugitive PM10 Control.** The following components shall be incorporated into the Dust Control Plan specified in APM AQ-3:

- Reduce speed on unpaved roads to less than 15 mph; and
- Apply soil stabilizers to inactive areas.

MM AQ-1b. **NO_X Mitigation Menu.** If, after completing the comprehensive inventory list identified in APM AQ-1 and associated fleet-wide NOX and PM emission reductions, Project emissions still exceed the air district thresholds for NOX, PG&E shall implement one or a combination of the following mitigation measures (as directed by the applicable air district) to achieve a reduction in NOX to less than the applicable air district's daily threshold of significance for construction:

- Use PuriNO$_X$ reformulated diesel fuel in some or all of the fleet of construction equipment;
- Install diesel catalytic reduction equipment (Cleaire Lean NO$_X$ Catalyst or equivalent) on some or all of the fleet of construction equipment during the construction Project;
- Install the same Lean NO$_X$ Catalyst on third-party diesel equipment operating within the Yolo-Solano/Sacramento nonattainment area for a period not less than one year of operation; or
- Pay a mitigation fee to the respective local air districts to offset NO$_X$ emissions which exceed the applicable thresholds after all other mitigation measures have been applied.

Rationale for Mitigation

MM AQ-1a reduces the estimated fugitive dust emissions from the Project construction. The mitigated output for Line 407 East and the DFM is provided in Appendix D-4 and D-5. Incorporation of this measure reduces the maximum daily emissions of PM_{10} to 29.19 lbs/day for the DFM and to 29.69 lbs/day for Line 407 East, for a total of 58.87 lbs/day of PM_{10}, which is less than significant.

MM AQ-1b is based on previous recommendations of the SMAQMD and the YSAQMD for a previous natural gas pipeline project located near Rio Vista that exceeded the applicable NO$_X$ thresholds during construction. With application of MM AQ-1b, NO$_x$ impacts are reduced to less than significant.

Residual Impacts

Although implementation of MM AQ-1b would likely reduce ROG emissions associated with the Project, the amount of vicarious ROG reductions from implementation of the mitigation measure is unknown. Currently, there are no programs for offsetting construction emissions of ROG and impacts would remain significant.

Impact AQ-2: Construction or Operation Emissions Exceeding State or Federal Standards

The Project would result in emissions that substantially contribute to an exceedance of a State or Federal ambient air quality standard (Significant, Class I).

As described above in Impact AQ-1, short-term construction emissions would exceed local air district's significance thresholds for ROG and NO_X (ozone precursors) and PM_{10}. The Project area is currently nonattainment for Federal and State ozone standards and PM_{10}.

Although construction emissions are short-term, the generation of emissions exceeding the recommended thresholds would substantially contribute to existing exceedances of Federal and State standards. As discussed under Impact AQ-1, implementation of APM AQ1 through APM AQ-11 would reduce potential emissions from project construction. However, implementation of these APMs is not adequate to reduce construction impacts to less than significant. As a result, MMs AQ-1a and AQ-1b are required to be implemented.

<u>Mitigation Measures for Impact AQ-2 Construction or Operation Emissions Exceeding State or Federal Standards</u>

MM AQ-1a: Fugitive PM_{10} Control.

MM AQ-1b: NO_X Mitigation Menu.

<u>Rationale for Mitigation</u>

As described above in Impact AQ-1 above, mitigation measure AQ-1a reduces PM_{10} and AQ-1b reduces NO_X emissions from the Project's construction.

<u>Residual Impacts</u>

Implementation of mitigation measure AQ-1a would reduce the Project's construction-generated PM_{10} to less than significant. Implementation of mitigation measure AQ-1b would reduce the Project's construction-generated NO_X impact to less than significant for the YSAQMD, FRAQMD, SMAQMD, and PCAPCD. Although both ROG and NO_X are required for the formation of ozone and the reduction of either precursor affects the amount of ozone generated, the relationship between ROG and NO_X concentrations and the formation of ozone is nonlinear. According to the Draft Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan (Draft 8-Hour Plan), reductions in NO_X emissions are more effective at reducing high ozone levels in downwind areas than ROG reductions, on a ton-per-ton comparison (CARB 2008c). However, reductions of both ROG and NO_X are required to reach attainment of the ozone standards. Therefore, since the Project's construction would continue to exceed the regional ROG thresholds, the Project would substantially contribute to the existing exceedance for Federal and State ozone standards for the years of construction, and, therefore, impacts would remain significant.

Impact AQ-3: Increase in Greenhouse Gas Emissions

The Project would produce greenhouse gas emissions and contribute to climate change (Potentially Significant, Class II).

<u>PG&E's Existing Climate Change Actions</u>

PG&E participates in or leads the following programs designed to reduce climate change impacts in California:

- **EPA's Natural Gas STAR Program.** This program is a voluntary partnership that encourages companies to adopt cost-effective technologies and practices that improve operational efficiency and reduce emissions of methane;

- **PG&E's ClimateSmart™ Program.** This program allows PG&E customers to offset their GHG emissions from their energy use by paying to fund GHG emission reduction projects in California. Examples of GHG emission reduction projects funding through ClimateSmart™ include projects that capture methane gas from dairy farms and landfills and those that conserve and restore California's forests; and

- **California Climate Action Registry (CCAR).** PG&E is a charter member of CCAR, and completes a third-party-verified inventory of their CO_2 emissions.

The above programs represent PG&E's current "business-as-usual" activities that would reduce potential emissions from the Project through offsets for natural gas consumption and reduced methane leakage from the proposed pipeline. However, the extent that these programs would actually reduce potential GHG emissions from the proposed Project is currently unknown.

Emission Estimation Assumptions

Construction. The Project would emit GHGs during construction of the pipeline from combustion of fuels in worker vehicles accessing the site as well as the construction equipment. The Project would also emit GHGs during the transportation of pipeline materials to the Project site.

Exhaust emissions during construction of the Project were estimated using URBEMIS and OFFROAD emission factors, which are presented in Appendix D-6.

Operation. The Project would result in the conveyance of existing and additional supplies of natural gas to end users. The throughput volume used to calculate end-use natural gas consumption was provided by PG&E. PG&E estimated the Project natural gas throughput based on growth projections for the area to be 113,000 million cubic feet. Development of the Project is a response to planned growth in the Project area. As discussed in Section 1.0,, Introduction, PG&E's existing transmission system in the Sacramento Valley region no longer provides sufficient capacity to deliver reliable natural gas service to existing customers, or to extend service to the planned development in the greater Sacramento region. The projected land use development in the Sacramento region requires that PG&E increase local gas transmission pipeline capacity. The capacity of the proposed Project is designed to accommodate existing and approved growth. As a result, the GHG emissions resulting from the operation of the Project are included in the CARB's projected future inventories because the emissions would result from "business-as-usual" growth of anticipated land use. In addition, PG&E's current programs that reduce GHG emissions from their existing operations are also considered to fall under CARB's "business-as-usual" scenario for statewide GHG emission reductions and are already assumed to apply to the Project and its future demand-side natural gas consumers.

Emissions Inventory

The Project would emit GHGs such as carbon dioxide, methane, and nitrous oxide from the exhaust of equipment used during construction. The Project would also emit exhaust of vehicles during operation. The emissions inventory from construction and operation of the Project are presented below in Table 4.3-12 and Table 4.3-13. Detailed GHG calculations are provided in Appendix D-6.

Table 4.3-12: Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2009 (Line 406)	790.33	716.99
2010 (Line 407 East)	970.45	880.40
2010 (DFM)	199.85	181.30
2012 (Line 407 West)	995.64	903.25
Total	**2,956.28**	**2,681.94**

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).
Source: Michael Brandman Associates 2009.

Table 4.3-13: Operational CO_2 Emissions (2010)

Activity	Emissions		
	Annual Pounds	Annual Tons	$MTCO_2e$
Maintenance / Inspection / Testing	166.33	3.24	2.94

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).

As shown in the tables above, the total metric tons of carbon dioxide equivalents ($MTCO_2e$) produced during construction of the Project are 2681.94. In year 2010, Project-related annual $MTCO_2e$ resulting from annual inspection and maintenance would be approximately 2.94 $MTCO_2e$. This project would generate a small amount of operational GHG emissions from periodic maintenance activities. Therefore, operational GHG emissions are less than significant.

While the construction emissions would occur only during the brief construction period, the emissions would result in a net increase in the production of GHG. Therefore, the construction emissions are considered significant. APM AQ-1, APM AQ-4, APM AQ-7, APM AQ-8, and APM AQ-10 have the potential to reduce construction-generated GHG emissions. However, there are insufficient details in these measures and/or lack of a methodology allowing the reductions to be quantified for these measures. Therefore, implementation of these APMs is insufficient to reduce the impact to less than significant. Implementation of MM AQ-3 is required to reduce construction emissions impacts to a less than significant level.

MM AQ-3 **GHG Emission Offset Program.** The applicant shall participate in a Carbon Offsets Program with CCAR, CARB, or one of the local air districts, and will purchase carbon offsets equivalent to the projected project's GHG emissions to achieve a net zero increase in GHG emissions during the construction phase.

Rationale for Mitigation

Project related emissions will result in a temporary increase due to the construction vehicles and activities. By participating in an Emissions Offset Program, these emissions will be offset through implementation of an established emissions reduction program. Implementation of MM AQ-3 would reduce construction emissions impacts to a less than significant level.

4.3.6 Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize environmental impacts of the proposed Project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that would be avoided as a result of the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and the options are depicted in Figure 3-2A through Figure 3-2K. A comparison of the air quality impacts of the project alternatives is found in Table 4.3-34. APMs AQ-1 through AQ-11, designed to reduce potential emissions from project construction, would apply to all twelve options.

No Project Alternative

Under the No Project Alternative, no new natural gas pipeline or above-ground stations would be constructed by PG&E in Yolo, Sutter, Sacramento, and Placer counties. There would be no construction and operational emissions associated with the Project. No construction or operational air quality impacts would result under the No Project Alternative.

Option A

Under Option A, the length of Line 406 would be increased by approximately 2,200 feet.

Construction Criteria Pollutants

As described above under Methodology, the construction-related analysis used an estimate of peak construction activity to calculate the maximum daily air pollutant emissions of concern. The maximum daily emissions calculated for Line 406 reflect the worst-case construction scenario that could occur on any one day, on any portion of Line 406. The maximum daily emissions for Line 406 were calculated using the peak trenching activity, construction employee trips, water truck emissions, fugitive dust emissions, soil hauling and pipe hauling. Although lengthening the Project by approximately 2,200 feet under Option A may potentially lengthen the duration of construction, Option A would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option A would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option A and Line 406 are provided in Table 4.3-14.

Table 4.3-14: Option A Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 406 Portion (2009)	373.31	36.48	107.07	80.38	14.44
Option A (2009)	373.31	36.48	107.07	80.38	14.44
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option A was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 2,200 feet of pipeline would be constructed using trenching methods, Option A would increase total Project GHG generation by 16.66 tons of CO_2. Option A would increase calculated Line 406 GHG generation by approximately 2 percent and would increase the total proposed Pipeline GHG generation, estimated as

2,681.94 $MTCO_2e$, by less than 1 percent. Table 4.3-15 displays Option A and Line 406 construction-generated GHG emissions.

Table 4.3-15: Option A Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2009 (Line 406)	790.33	716.99
Option A	16.66	15.11
Total Line 406 with Option A	**806.99**	**732.10**

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).
Source: Michael Brandman Associates 2009.

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option A, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option A, if selected. Therefore, implementation of MM AQ-3 would reduce the Option A construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option A would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option A would be less than significant, the same as for the proposed Project.

Option B

Under Option B, the length of Line 406 would be increased by approximately 2,640 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 2,640 feet under Option B may potentially lengthen the duration of construction, Option B would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option B would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option B and Line 406 are provided in Table 4.3-16.

Table 4.3-16: Option B Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 406 Portion (2009)	373.31	36.48	107.07	80.38	14.44
Option B (2009)	373.31	36.48	107.07	80.38	14.44
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option B was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 2,640 feet of pipeline would be constructed using trenching methods, Option B would increase total Project GHG generation by 19.86 tons of CO_2. Option B would increase calculated Line 406 GHG generation by approximately 2.5 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by less than 1 percent. Table 4.3-17 displays Option B and Line 406 construction-generated GHG emissions.

Table 4.3-17: Option B Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2009 (Line 406)	790.33	716.99
Option B	19.86	18.02
Total Line 406 with Option B	**810.19**	**735.007**
Notes: Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons). Source: Michael Brandman Associates 2009.		

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option B, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option B, if selected. Therefore, implementation of MM AQ-3 would reduce the Option B construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option B would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option B would be less than significant, the same as for the proposed Project.

Option C

Under Option C, the length of Line 406 would be increased by approximately 1,150 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 1,150 feet under Option C may potentially lengthen the duration of construction, Option C would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option C would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option C and Line 406 are provided in Table 4.3-18.

Table 4.3-18: Option C Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 406 Portion (2009)	373.31	36.48	107.07	80.38	14.44
Option C (2009)	373.31	36.48	107.07	80.38	14.44
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option C was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 1,150 feet of pipeline would be constructed using trenching methods, Option C would increase total Project GHG generation by 8.65 tons of CO_2. Option C would increase calculated Line 406 GHG generation by approximately 1 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by less than 0.5 percent. Table 4.3-19 displays Option C and Line 406 construction-generated GHG emissions.

Table 4.3-19: Option C Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2009 (Line 406)	790.33	716.99
Option C	8.65	7.85
Total Line 406 with Option C	**798.98**	**724.837**

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).
Source: Michael Brandman Associates 2009.

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option C, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option C, if selected. Therefore, implementation of MM AQ-3 would reduce the Option C construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option C would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option C would be less than significant, the same as for the proposed Project.

Option D

Under Option D, the length of Line 406 would be increased by approximately 860 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 860 feet under Option D may potentially lengthen the duration of construction, Option D would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option D would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option D and Line 406 are provided in Table 4.3-20.

Table 4.3-20: Option D Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 406 Portion (2009)	373.31	36.48	107.07	80.38	14.44
Option D (2009)	373.31	36.48	107.07	80.38	14.44
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option D was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 860 feet of pipeline would be constructed using trenching methods, Option D would increase total Project GHG generation by 6.47 tons of CO_2. Option D would increase calculated Line 406 GHG generation by approximately 0.8 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by 0.2 percent. Table 4.3-21 displays Option D and Line 406 construction-generated GHG emissions.

Table 4.3-21: Option D Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2009 (Line 406)	790.33	716.99
Option D	6.47	5.87
Total Line 406 with Option D	**796.8**	**722.86**

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).
Source: Michael Brandman Associates 2009.

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option D, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option D, if selected. Therefore, implementation of MM AQ-3 would reduce the Option D construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option D would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option D would be less than significant, the same as for the proposed Project.

Option E

Under Option E, the length of Line 406 would be increased by approximately 3,480 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 3,480 feet under Option E may potentially lengthen the duration of construction, Option E would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option E would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option E and Line 406 are provided in Table 4.3-22.

Table 4.3-22: Option E Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 406 Portion (2009)	373.31	36.48	107.07	80.38	14.44
Option E (2009)	373.31	36.48	107.07	80.38	14.44
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option E was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 3,480 feet of pipeline would be constructed using trenching methods, Option E would increase total Project GHG generation by 28.39 tons of CO_2. Option E would increase calculated Line 406 GHG generation by approximately 3.6 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by 1 percent. Table 4.3-23 displays Option E and Line 406 construction-generated GHG emissions.

Table 4.3-23: Option E Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2009 (Line 406)	790.33	716.99
Option E	28.39	25.76
Total Line 406 with Option E	**818.72**	**742.75**
Notes: Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons). Source: Michael Brandman Associates 2009.		

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission

Offset Program) would reduce this impact to less than significant. Under Option E, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option E, if selected. Therefore, implementation of MM AQ-3 would reduce the Option E construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option E would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option E would be less than significant, the same as for the proposed Project.

Option F

Option F would not alter the length of the segment or change the construction methods for Line 406. Therefore, Option F would result in the same construction-generated maximum daily air emissions and total GHGs as the proposed Project. The maximum daily construction emissions for Option F are the same as for Line 406. Option F would not increase or reduce the operational emissions. Impacts would be the same as the proposed Project.

Option G

Option G would not alter the length of the segment or change the construction methods for Line 407 W. Therefore, Option G would result in the same construction-generated maximum daily air emissions and total GHGs as the proposed Project. The maximum daily construction emissions for Option G are the same as for Line 407 W. Option G would not increase or reduce the operational emissions. Impacts would be the same as the proposed Project.

Option H

Under Option H, the length of Line 407 W would be reduced by approximately 2,900 feet. Under Option H, the length of the DFM would not change.

Construction Criteria Pollutants

As described above under Methodology, the construction-related analysis used an estimate of peak construction activity to calculate the maximum daily air pollutant emissions of concern. The maximum daily construction emissions for the portion of Option H that replaces the proposed DFM alignment are the same.

Although reducing the Project by approximately 2,970 feet under Option H may potentially reduce the duration of construction, Option H would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option H would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option H and Line 407 W are provided in Table 4.3-24.

Table 4.3-24: Option H Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 407 W Portion (2012)	300.69	30.58	89.58	77.10	14.19
Option H (2012)	300.69	30.58	89.58	77.10	14.19
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option H was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the reduced 2,900 feet of pipeline would be constructed using trenching methods, Option H would reduce total Project GHG generation by 24.01 tons of CO_2. Option H would reduce calculated Line 407 W GHG generation by approximately 2.5 percent and would decrease the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by less than 1 percent. The portion of Option H that replaces the proposed DFM alignment would not increase or decrease total construction-generated GHG emissions. Table 4.3-25 displays Option H and Line 407 W construction-generated GHG emissions.

Table 4.3-25: Option H Decrease in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2012 (Line 407 W)	995.64	903.25
Option H	-24.01	-21.78
Total Line 407 W with Option H	**971.63**	**881.468**

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
Notes: Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons). Source: Michael Brandman Associates 2009.		

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option H, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option H, if selected. Therefore, implementation of MM AQ-3 would reduce the Option H construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option H would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option H would be less than significant, the same as for the proposed Project.

Option I

Under Option I, the length of Line 407 E by would be increased approximately 2,900 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 2,900 feet under Option I may potentially lengthen the duration of construction, Option I would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option I would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option I and Line 407 E are provided in Table 4.3-26.

Table 4.3-26: Option I Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 407 E Portion (2010)	359.86	35.00	102.86	79.78	14.62
Option I (2010)	359.86	35.00	102.86	79.78	14.62
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option I was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 2,900 feet of pipeline would be constructed using trenching methods, Option I would increase total Project GHG generation by 23.88 tons of CO_2. Option I would increase calculated Line 407 E GHG generation by approximately 2.5 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by less than 1 percent. Table 4.3-27 displays Option I and Line 407 E construction-generated GHG emissions.

Table 4.3-27: Option I Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2010 (Line 407E)	970.45	880.4
Option I	23.88	21.66
Total Line 407E with Option I	**994.33**	**902.064**
Notes: Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons). Source: Michael Brandman Associates 2009.		

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option I, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option I, if selected. Therefore, implementation of MM AQ-3 would reduce the Option I construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option I would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option I would be less than significant, the same as for the proposed Project.

Option J

Under Option J, the length of Line 407 E would be increased by approximately 5,250 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 5,250 feet under Option J may potentially lengthen the duration of construction, Option J would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option J would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option J and Line 407 E are provided in Table 4.3-28.

Table 4.3-28: Option J Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 407 E Portion (2010)	359.86	35.00	102.86	79.78	14.62
Option J (2010)	359.86	35.00	102.86	79.78	14.62
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option J was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 5,250 feet of pipeline would be constructed using trenching methods, Option J would increase total Project GHG generation by 42.86 tons of CO_2. Option

J would increase calculated Line 407 E GHG generation by approximately 4.5 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by almost 1.5 percent. Table 4.3-29 displays Option J and Line 407 E construction-generated GHG emissions.

Table 4.3-29: Option J Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2010 (Line 407E)	970.45	880.4
Option J	42.86	38.88
Total Line 407E with Option J	**1,013.31**	**919.283**

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).
Source: Michael Brandman Associates 2009.

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option J, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option J, if selected. Therefore, implementation of MM AQ-3 would reduce the Option J construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option J would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option J would be less than significant, the same as for the proposed Project.

Option K

Under Option K, the length of Line 407 E would be increased by approximately 70 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 70 feet under Option K may potentially lengthen the duration of construction, Option K would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option K would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option K and Line 407 E are provided in Table 4.3-30.

Table 4.3-30: Option K Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 407 E Portion (2010)	359.86	35.00	102.86	79.78	14.62
Option K (2010)	359.86	35.00	102.86	79.78	14.62
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option K was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 70 feet of pipeline would be constructed using trenching methods, Option K would increase total Project GHG generation by 0.58 ton of CO_2. Option K would increase calculated Line 407 E GHG generation by less than 0.1 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by 0.02 percent. Table 4.3-31 displays Option K and Line 407 E construction-generated GHG emissions.

Table 4.3-31: Option K Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2010 (Line 407E)	970.45	880.4
Option K	0.58	0.53
Total Line 407E with Option K	**971.03**	**880.926**
Notes:		

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons). Source: Michael Brandman Associates 2009.		

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option K, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option K, if selected. Therefore, implementation of MM AQ-3 would reduce the Option K construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option K would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option K would be less than significant, the same as for the proposed Project.

Option L

Option L would not increase or decrease the length of Line 407 E. However, under Option L, approximately 1,000 feet of trenching for Line 407 E would be replaced by HDD.

Construction Criteria Pollutants

As described above under Methodology, the construction-related analysis used an estimate of peak construction activity to calculate the maximum daily air pollutant emissions of concern. The maximum daily emissions calculated for Line 407 E reflect the worst-case construction scenario that could occur on any one day, on any portion of Line 407 E. The maximum daily emissions for Line 407 E were calculated using the peak trenching activity, construction employee trips, water truck emissions, fugitive dust emissions, soil hauling and pipe hauling. Therefore, although approximately 1,000 feet of trenching would be replaced by HDD under Option L, Option L would not modify the estimated peak daily construction activity scenario for Line 407 E, and selection of Option L would not change the significance of Line 407

E construction (Class I). Implementation of MM AQ-1a and AQ-1b would be required.

However, the maximum daily construction emissions for Option L would be based on HDD activity, pipe hauling and soil hauling. Therefore, daily air pollutant generation from Option L construction activity would be lower than for the portion of the proposed alignment that would be replaced by Option L. Maximum daily construction emissions from Option L and Line 407 E are provided in Table 4.3-32.

Table 4.3-32: Option L Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 407 E Portion (2010)	359.86	35.00	102.86	79.78	14.62
Option L (2010)	136.64	12.23	39.71	54.42	11.12
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option L was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Option L would increase total Project GHG generation by 62.19 tons of CO_2 by replacing a proposed 1,000-foot section of trenching (at 8.16 tons CO_2) with 1,000 feet of HDD (70.35 tons CO_2).

Option L would increase calculated Line 407 E GHG generation by more than 6 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by approximately 2 percent. Table 4.3-33 displays Option L and Line 407 E construction-generated GHG emissions.

Table 4.3-33: Option L Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2010 (Line 407E)	970.45	880.4
Option L	62.19	56.42
Total Line 407E with Option L	**1,032.64**	**936.819**

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
Notes: Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons). Source: Michael Brandman Associates 2009.		

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option L, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option L, if selected. Therefore, implementation of MM AQ-3 would reduce the Option L construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option L would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option L would be less than significant, the same as for the proposed Project.

Table 4.3-34: Comparison of Alternatives for Air Quality

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impacts
Option B	Similar Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts

Alternative	Comparison with Proposed Project
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

4.3.7 Cumulative Projects Impact Analysis

Section 3.0, Alternatives and Cumulative Projects, provides a description of identifiable projects that may be constructed in proximity to the proposed Project. These projects have potential cumulative impacts related to the air quality impacts of the proposed Project. When considered with the cumulative projects, the Project would result in cumulative impacts by contributing to an exceedance of the State and Federal ozone standards. The above projects would generate construction emissions that contribute towards the existing ozone exceedances. The projects, when considered together, would cumulatively contribute to the existing ozone exceedances.

When considered with the cumulative projects, the Project would not result in cumulative net increase of criteria pollutants, as the Project itself would not result in a net increase in criteria pollutants or ozone precursors from Project operations. In addition, the Project operation would not contribute to cumulative odor or toxic air contaminant impacts.

Climate change is essentially a cumulative impact—even a very large individual project cannot generate enough GHG emissions to influence global climate change in a measurable way. Based on the CARB GHG emission inventories, it is statewide and regional land use development, transportation patterns and associated policies that create the cumulative impacts to climate change.

As a result, in order to assess the cumulative impact of an individual project on climate change, large-scale assessments and emission reduction strategies would need to be formulated to comprehensively address GHG emissions on a statewide and regional level from the combination of land use patterns, energy generation and consumption, transportation, water transport, waste disposal, and the other major sources of GHG emissions.

Without such large area assessments that address the larger cumulative nature of GHGs and create a framework for comprehensive GHG emission reductions at the local level, the ability to measure and determine a project's cumulative impact to climate change through the creation of GHG emissions "when added to closely related past, present, and reasonably foreseeable probable future projects" (the CEQA Guidelines section 15355) is speculative at this time and no significance determination can be made.

According to the CEQA Guidelines section 15145, "If, after a thorough investigation, a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate the discussion of the impact." The ability to assess the contribution of the GHG emissions from the proposed Project on cumulative global climate change impacts is speculative at this time for the following reasons:

- The potential list of cumulative projects that, when combined with the potential effects of the proposed Project on climate change is unknown, in that it could conceivably include all projects around the globe. Guidelines for establishing the radius for global climate change have not yet been adopted. Without such guidelines, it is impossible to know how big the cumulative impact study area is supposed to be for a particular project. For example, does the list of project include those only within a one-mile radius of the project, or does it include projects within the entire air basin, or the state of California? For this reason, the "project list" approach for conducting a CEQA cumulative impacts analysis is not feasible;

- There is no approved statewide or regional GHG reduction target or plan that covers the local Project area; therefore, the plan approach is not viable at this time. As a result, no such document exists to base such a cumulative discussion or significance finding on. State and local agencies are currently trying to develop strategies to reduce GHGs in their jurisdictions; however, these strategies are not complete at this time; and

- There are no approved methodologies, procedures or guidelines that specify how to calculate and determine the specific linkages and potential impacts that an individual project might have in creating changes to climate.

4.3.8 Summary of Impacts and Mitigation Measures

As detailed above, the Project would result in construction emissions that exceed the quantitative significance thresholds established by the local air pollution control districts, as well as result in construction emissions that substantially contribute to an exceedance of the Federal and State ozone standards. Table 4.3-35 presents a summary of impacts on air quality and the recommended mitigation measures.

Table 4.3-35: Summary of Air Quality Impacts and Mitigation Measures

Impact	Mitigation Measure
AQ-1. Construction or operational emissions exceeding regional thresholds.	**AQ-1a.** Fugitive PM_{10} control. **AQ-1b.** NO_X mitigation menu.
AQ-2. Construction or operational emissions exceeding State or Federal standards.	**AQ-1a.** Fugitive PM_{10} control. **AQ-1b.** NO_X mitigation menu.
AQ-3. Increase in GHG Emissions.	**AQ-3.** GHG Emission Offset Program.
Source: Michael Brandman Associates 2009.	